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ABSTRACT

This second special issue of the Health Education Monograph Series on HIV/AIDS Prevention in Rural Communities presents seven articles: (1) "Preventing Maternal-Infant Transmission of HIV: Social and Ethical Issues" (James G. Anderson, Marilyn M. Anderson, and Tara Booth); (2) "HIV Infection in Diverse Rural Population: Migrant Farm Workers in Indiana" (Janet Arno); (3) "New Drugs for Treatment for AIDS and Cost Implications" (Stephen R. Bryn, James G. Anderson, and Marilyn M. Anderson); (4) "Behavioral Intention and Use of Condoms for HIV/AIDS Prevention among African-American Students" (Andrew J. Kanu); (5) "Breaking Confidence about Risky Sexual Behavior: Rural Area, Race, Gender, Sexual Orientation, and Other Factors" (Shobha Pais and Fred Piercy); (6) "Prevention of HIV/AIDS in Rural Communities" (Mohammad R. Torabi and Kele Ding); and (7) "Efficacy of Two School-Based Interventions Designed to Reduce Rural Adolescent Risk of HIV/STD" (William L. Yarber and Richard A. Crosby). (All articles contain references.) (SM)

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Volume 15, Number 2
1997

The Health Education Monograph

Series

Prevention of HIV/Aids Education In Rural Communities II

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The Health Education Monograph Series

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Foreward

I am delighted to present to you the second special issue of the **Health Education Monograph Series** on *HIV/AIDS Prevention in Rural Communities*.

This publication deals with very timely topics related to HIV/AIDS Education in Rural Communities. The Rural Center for AIDS/STD Prevention is a joint project of Indiana University and Purdue University. This Center provided complete funds for production and distribution of this issue to the entire membership of the National Health Education Honorary. An additional 3,000 copies will be disseminated by the Center. Almost all of these articles were presented during the second Center's annual conference in April, 1995. Also, these studies were funded by the Center. I would like to extend my utmost appreciation to the authors who worked diligently to make this additional publication a reality.

Obviously, the AIDS epidemic does not recognize any boundary. It has effected profoundly the world communities regardless of gender, age, religion, nationality, ethnicity, sexual orientation, geographic or political boundaries or socioeconomic status.

The AIDS epidemic has given a new challenge to scientists in all disciplines and accentuates the notion of prevention through education, self and community empowerments. While some highly urbanized communities received more attention and resources for combating prevalence of HIV/AIDS, the rural communities have been relatively ignored. That is why the incidence of HIV/AIDS infection is growing fast in rural communities. Our Center is practically the only educational and research center that has concentrated its efforts in focusing on prevention of HIV/STD in rural communities. This issue includes various research and education projects dealing with different dimensions of HIV/STD prevention in rural communities.

On behalf of the National Executive of Eta Sigma Gamma, I welcome professional organizations, resarch, and educational centers to consider sponsoring a special issue of ***The Health Education Monograph Series*** for future publications related to health education. Additional issues will receive full editorial process employed for production of our regular monograph series. As the editor of the Monograph Series and co-director of the Rural Center for AIDS/STD Prevention, I am delighted that the Center sponsored the second issue.

I would like to thank Ms. Kathy Finley for her assistance in preparing the publication and Ms. Joyce Arthur for her technical assistance. Also, the assistance of Ms. Donna Ganion from our National ESG office is appreciated. Last, but not least, I would like to offer my appreciation to each and every member of the National Executive Committee who are very committed to supporting these monograph series.

Finally, thank you for sharing your comments with me regarding the past Monograph Series. As always, I am eager to hear your criticisms, comments, and suggestions regarding these publications. Your input is essential in improving the publication and ultimately serving our members and the profession in the most effective way. I do hope that you, as loyal members of this National Professional Health Education Honorary, check your college/university libraries and make sure that they receive ***The Health Education Monograph Series***. If not, please request that they subscribe to these important publications by calling 1-800-715-2559. It is a privilege for me to serve the Eta Sigma Gamma members and our profession.

I look forward to hearing from you.

Mohammad R. Torabi, PhD,MPH,CHES
Editor, ***The Health Education Monograph Series*** and Co-Director of the Rural Center for AIDS/STD Prevention

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Preventing Maternal-Infant Transmission of HIV: Social and Ethical Issues

James G. Anderson, Ph.D., Marilyn Anderson, B.A., Tara L. Booth, B.A.

Abstract

This study examines the social and ethical issues involved in preventing maternal-infant transmission of the HIV virus. Every year 7000 infants test positive for the HIV virus; without treatment 25.5 percent and with treatment 8.3 percent of the newborns will be infected. Under current laws, women must undergo counseling and then volunteer in order to be tested. Advocates for mandatory testing believe it is unethical not to test mothers when HIV transmission is reduced by two-thirds with treatment. Those against mandatory testing believe the mother's right to privacy is at risk and no woman should be compelled to undergo HIV testing. For this study, interviews were conducted with 7 RNs, 5 MDs, 1 patient advocate, and 1 Indiana State Representative.

Physicians and nurses differed in their support for mandatory HIV testing of pregnant women. Physicians, in general, opposed mandatory testing while nurses generally supported mandatory testing. Opposition to mandatory testing was largely based on the fear that women will refrain from seeking prenatal care if threatened by testing. Support was based on the public health concerns that mandatory testing will reduce the likelihood of transmission of the HIV virus to infants and to others.

Doctors and nurses also differed on their perceptions of the effects of a law mandating HIV testing. Physicians expressed concern that such a law will primarily affect how they provide prenatal care and physicians will be held legally accountable for violations of the law. Nurses perceive that the burden of compliance with the law will fall primarily on pregnant women. Noncompliance may lead to charges of abuse and neglect and may result in physicians refusing to treat the pregnant woman unless she agrees to be tested. Further research is needed to examine the economic issues surrounding mandatory testing and public perceptions concerning mandatory testing laws.

Prevalence of HIV Infection in Childbearing Women

The U.S. Centers for Disease Control and Prevention (CDC) established a family of serosurveys in 1987 to test discarded blood for the HIV virus. Because of opposition to mandatory screening and because there was no treatment or cure, the blood was tested without any links to the patient. Newborn nurseries were included in order to provide information on the incidence of the HIV virus in women giving birth. The residual blood specimens from newborn metabolic screenings were tested in 38 states and the District of Columbia.

Results as of September 1990 indicated that an estimated 1.5 per 1000 women, who gave birth in 1989, were infected with the HIV virus (Gwinn et al., 1991). By 1992, 44 states, including Washington, D. C., Puerto Rico and the U.S. Virgin Islands, had conducted "blind" and "unlinked" newborn HIV testing. Testing was done for screenings as a part of seroprevalene surveys among childbearing women in order to track the progression of the HIV/AIDS epidemic (Ploughman, 1995/1996). The highest HIV seroprevalence rates, as of 1990, were observed in New York State, 5.8 per 1000, and the District of Columbia, 5.5 per 1000. At the same time, some metropolitan areas along the East Coast had a seroprevalence of about 10 per 1000 among women who delivered infants in 1989 (Hardy, 1991). While data for Indiana were not reported, the rate for Ohio was 1.4 per 1000 and Illinois was 0.9 per 1000 women giving birth to infants in 1989 (Gwinn et al., 1991; Ploughman, 1995/1996).

Studies have estimated that the perinatal transmission rates of HIV is close to 30 percent (Oxtoby, 1990). Based on this rate, in 1989 it was estimated that 1 in every 2200 infants born in the U.S. was infected with HIV through perinatal exposure to the virus (Gwinn et al., 1991).

Data on the cumulative number of children in Indiana born to infected mothers are shown in Table 1. Through March 31, 1997, there have been a total of 126 cases of children born to HIV-infected mothers reported to the Indiana State Department of Health(ISDH). Of these cases, 44 percent were born to White women and 44 percent were born to Black women. Even though Black women only make up 8 percent of the Indiana population, according to the 1990 U.S. Census, they constitute a large proportion of the HIV infected population (ISDH, 1997). Nationally, 56.9 percent of African-American women and 20 percent of Hispanic women have AIDS, totaling 77 percent of the female AIDS population. The reported rate of infection is 16 times higher for African-American women compared to Caucasian women; Hispanic women have a rate of infection that is seven times greater (Ploughman, 1995/1996).

Clinical evidence suggests that the transmission of HIV from mother to infant can occur in utero, during labor and delivery, and throughout breastfeeding after birth (Rogers and Jaffe, 1994; Ploughman, 1995/1996). HIV infection is the seventh leading cause of death in the United States for

children between the ages of one to four years of age (Rogers and Jaffe, 1994). By the end of 1995, over 90 percent of AIDS cases reported in children were acquired through mother-to-infant transmission of the HIV virus (Landers and Sweet, 1996). Currently 7,000 HIV-infected women give birth in the United States with 1,000 to 2,000 of the infants also being HIV infected (Rogers and Jaffe, 1994; Mauskopf, Wichman, White, & Tilson, 1996; Minkoff and Willoughby, 1995). As many as 80,000 women of reproductive-age could be infected with the HIV virus (Gwinn et al., 1991). Between 25 to 50 percent of all children with perinatally acquired HIV infection develop AIDS within the first year of life, and nearly 80 percent develop AIDS within 3 to 5 years (Frederick et al., 1994; Mauskoph et al., 1996).

Zidovudine Treatment

In 1994 Clinical trials demonstrated that if HIV-infected pregnant women and their newborns are provided antiretroviral therapy, the risk of perinatal transmission of HIV is significantly reduced. The proportions of infants infected at 18 months with the HIV virus were 8.3 percent in the zidovudine group and 25.5 percent in the placebo group. Later these results were updated to 7.9 percent if treated with zidovudine and 27.7 percent if the infant was in the placebo group (Connor et al., 1994; Minkoff and Willoughby, 1995). Without treatment, an HIV-positive woman has a 14 percent chance of transmitting the virus to her infant while breastfeeding (Ploughman, 1995/1996). According to these results, the study group Protocol 076 showed a reduction of two thirds in the transmission of HIV type 1.

The mechanism of action of zidovudine in reducing the risk of maternal to infant transmission is not currently known. It presumably prevents HIV transmission by decreasing the maternal viral titer or by preventing the establishment of infection in the fetus (Rogers and Jaffe, 1994). The zidovudine therapy may be less effective in women with more advanced disease: those who have received long-term zidovudine therapy, or those who are infected with resistant strains of HIV (Connor et al., 1994; Ploughman, 1995/1996).

The current data indicate that between 50 and 70 percent of cases of maternal-infant HIV transmission occurs late in gestation or during labor (Rogers and Jaffe, 1994). Also, the rupture of fetal membranes more than four hours before delivery is linked to higher transmission rates (Landesman et al., 1996). Further, delivery mode has also been linked to a lower incidence of mother to infant transmission rate. Cesarean section has been said to lower the risk of HIV transmission in several retrospective reports. However, in the United States, zidovudine is recommended to pregnant women with HIV and cesarean section is not seen as an alternative method for "treatment" (Landers and Sweet, 1996).

Zidovudine (ZDV or AZT) was demonstrated to be safe in phase 1 studies when used for short periods of time (Connor et al., 1994); however, this treatment is not without risk. A few women discontinued the study due to some of the minimal short-term toxic effects that were observed. Anemia, which was mild and reversible, was the only short-term toxic effect among the infants that was directly attributed to zidovudine (Connor et al., 1994). In the zidovudine experiment, some of the women had anemia (of more than moderate severity), neutropenia, or thrombocytopenia. Some had abnormalities, of more than moderate severity, of serum electrolytes and liver function. Most of the adverse effects were believed to be related to labor and delivery (Connor et al., 1994). However, Ploughman (1995/1996:183-184) listed several limitations related to this treatment:

> These limitations include: perinatal HIV transmission despite ZDV therapy; unknown efficacy of the therapy for pregnant women with advanced disease, prior antiretroviral therapy, or with strains of ZDV-resistant virus; short-term adverse effects of ZDV unknown; long-term adverse effects (that is , potential mutagenic, carcinogenic, or teratogenic effects) for the child exposed to ZDV in utero and in infancy; and it is unknown if the use of ZDV during pregnancy will affect the drug's efficacy of the woman when it becomes clinically indicated for her own health(pp. 183-184).

Despite being treated with zidovudine, some infants became infected with HIV anyway. The infections may have occurred due to (1) HIV being transmitted prior to treatment; (2) zidovudine being inefficient in suppressing the maternal viral replication; (3) the mother not complying with the treatment regimen; (4) or the unique characteristics of the infecting maternal strain of HIV (such as decreased susceptibility to zidovudine) (Connor et al., 1994).

For those pregnant mothers who are HIV infected, a three-phase therapy is offered to reduce the risks of transmission of the virus to the infant (Mauskopf et al., 1996). In the first phase, oral zidovudine (100mg, 5 times a day) is given to the HIV positive pregnant woman. This is done on an outpatient basis between weeks 14 and 34 of gestation; the treatment continues in this manner until the onset of labor. The second phase constitutes intravenous zidovudine given during labor (dose of 2 mg/kg of body weight, followed by continuing the infusion of 1 mg/kg of body weight per hour until delivery). The final phase is treating the newborn infant orally with zidovudine syrup at 2mg/kg of body weight (this is every 6 hours beginning 8 to 12 hours after birth and continuing for the first 6 weeks of life) (Mauskopf et al., 1996).

Economics of Treatment

A study was performed on the economic impact of voluntary screening programs for HIV infection and treatment of HIV-positive pregnant women with zidovudine. The total expected lifetime cost for adult care and treatment until death is approximately $119,000; $50,000 from HIV treatment and $69,000 from AIDS to death (Ploughman, 1995/1996). "Ex-

pected total drug-acquisition costs for zidovudine per treated case under the ACTG 076 regimen (including all phases of treatment) are $895, using published average wholesale prices" (Mauskoph et al., 1996, p. 133). The additional medical costs are estimated at $150 which includes expenses such as additional laboratory tests. The current estimate of annual expenses for children infected with the HIV virus are $9,382 and $37,928 for children with AIDS (Hsia, Fleishman, East, Hellinger, 1995). Children who progress into AIDS earlier (25%) will have an approximate lifetime cost of $45,039. For those children who progress later (75%), the lifetime cost is estimated at $116,873. The weighted average lifetime cost would be $98,915 (Mauskoph et al., 1996). The total estimated savings attributable to treatment with zidovudine per 100 woman-infant pairs is $1,596,831 (Mauskoph et al., 1996).

Screening Programs

As a result of these studies, a task force of the U.S. Public Health Service in 1995 recommended not only that all pregnant women receive counseling, but also that they be offered voluntary HIV testing (Centers for Disease Control and Prevention [CDC], 1995). As for children, hospitals have continued the blind screening of blood from newborn infants. "California, Florida, Iowa, Illinois, Michigan, Rhode Island, Texas, Delaware, Connecticut, and Washington state have enacted laws regarding HIV testing of pregnant women and fetuses or newborns" (Ploughman, 1995/1996, p.189). Florida has deemed HIV as a type of sexually transmitted disease (STD). According to Florida law, all STDs must be tested for during pregnancy, mandating an HIV test for all pregnant women in the state (Ploughman, 1995/1996).

Evidence of the success of the voluntary screening program is not promising. In 1991, more women who reported having a live-born infant in the preceding 5 years had been tested for HIV (25.7%) compared to all women in the childbearing age group of 18-44 years (18.8%) (CDC, 1996). "Among women who reported having a live-born infant during the preceding 5 years, testing rates were highest among Hispanics (35.0%) and Blacks (33.4%), women with less than 12 years of education (34.0%), and those living in poverty (36.2%)" (CDC, 1996, p.736). Compared with all never-married women in this age group (17.4%), about twice as many never-married women who reported having a live born-infant during the preceding 5 years had an HIV test (32.5%) (CDC, 1996).

More recently, one report from New York City indicated that only 39 percent of HIV-infected pregnant women were identified and only 25 percent of these women agreed to be treated with zidovudine (Wiznia et al., 1996; Crawford, 1995). Further, in New York an unofficial Center for Disease Control survey found "at least 50 percent of children diagnosed with PCP had not previously been identified as HIV-positive" (Crawford, 1995, p.129). A second report from North Carolina also indicated the 25 percent of the pregnant women who were HIV-infected declined treatment (Fiscus et al., 1996). Findings such as these prompted a federal law that requires mandatory testing of infants born to mothers whose HIV status is unknown. Mandatory testing will begin in the year 2000 unless a state can demonstrate a 50 percent reduction in the number of HIV-positive newborns or that 95 percent of pregnant women are tested for the HIV virus (Landers and Sweet, 1996).

Currently there is an active debate over whether HIV testing of pregnant women and their infants should continue to be voluntary or should be made mandatory. The argument made in the past against screening pregnant woman was based on the premise that no difference existed if the woman was tested. Little therapy, if any existed for these woman and their infants. Today, this is no longer the case; medical advances have increased the ability to treat HIV infection and old arguments hold little ground. Health care professionals in the area of preventative medicine, feel it is necessary to include routine antibody testing, along with counseling and informed consent, as part of routine prenatal care. Heagarty and Abrams (1992) believe that "it is increasingly difficult to defend the continued anonymity of state-wide newborn-screening programs in areas where the prevalence of HIV infection is high" (1992, p. 887). They state that the time has come when the testing of women and infants on a wide-scale basis is both warranted and justifiable. Heagarty and Abrams do admit that confidentiality must be protected; yet, those infected with HIV cannot be treated unless identified.

Gorman (1994, p. 60-61) agreed that the strategy of blind infant testing made sense at first since the cure has eluded doctors. Yet, he also believes since doctors can use antibiotics and other drugs to ward off many of the complications, the situation and procedures should be rethought. Even when people recognize the need to protect infants and many hospitals have instituted counseling programs about the benefits of knowing the infants' and mothers' HIV status, convincing pregnant women to volunteer for an HIV test is often difficult (Gorman, 1994, p.60-61).

The medical providers today have led many clinicians to argue for testing pregnant women. However, many advocates for patients affected by this disease are skeptical about the claims made on behalf of zidovudine treatment during pregnancy (Bayer, 1994). Some professionals believe an effort to change current practices on the basis of the new finding constitutes "malpractice." At the heart of the skepticism lies the fear that the new clinical findings may destroy or override the privacy rights for pregnant women who are at risk for HIV (the vast majority are poor Black or Hispanic women). The main reason why having a blind test for infant HIV screening was acceptable was that no child or mother could be identified; without informed consent, testing would be ethically unacceptable (Bayer, 1994).

There is a well established ethical principle that the state is responsible for protecting the medical interests of the child; in some instances this includes overriding the wishes of the parents. However, the opposition to this opinion believes

"... no woman should ever be compelled to undergo testing for HIV" (Bayer, 1994, p.1224). Traditionally, adult patients have the right to refuse or accept medical recommendations based on personal beliefs, a right that has been respected and protected by law (Nelson and Milliken, 1988). Mandatory testing requires mandatory identification of infected mothers. Therefore, this is ethically and politically unacceptable. Also, for those children who are infected, not much can be done to extend the life-expectancy of the HIV infected child (Bayer, 1994).

Bayer (1994) believes that the mandatory screening of children is justifiable if therapeutic interventions could extend their lives, regardless of parental objections. However, mandatory screening of pregnant women is not acceptable since it is virtually never acceptable to have mandatory treatment of competent adults. Further, adults have the right to refuse care, even if the care will save their lives or if others deem the refusal as foolish or irresponsible. Another issue Bayer addresses is how to enforce testing and mandating the use of zidovudine. Lastly, Bayer believes no recommendation for HIV testing would be ethical if access to the needed therapy and support was not ensured. What about all of the uninsured individuals that would be required to be tested, but could not afford treatment?

Constitutional and Legal Aruguments

There are several constitutional arguments as to why HIV testing should be voluntary. These arguments are as follows: "A constitutional analysis of state-sponsored programs that test mothers, fetuses, and newborns for HIV must consider the mother's rights to liberty and to privacy, the state's interest in the welfare of children and public health, and the circumstances under which the state's interest outweighs the mother's rights... (Ploughman, 1995/1996, p.194). The Fourth Admendment protects "personal privacy and dignity against unwarranted intrusion by the State." The court balances the individual's right to privacy with the state's need to intrude. This is done to determine if intruding on a person's right to privacy is reasonable. "Equal protection claims pursuant to the Fifth (federal actions) and Fourteenth (state actions) Amendments arise when a government action attempts to create a new classification of persons who are subject to federal or state regulation." (Ploughman, 1995/1996, p.196). This causes classification based on gender and race to be suspect because of the long history of unequal treatment in the United States.

As of July 1995, the CDC required medical professionals to routinely offer HIV counseling and voluntary testing to all women who are pregnant in the United States. Some of the legislators in Indiana are attempting to mandate testing for the HIV virus in pregnant women. They base their arguments on the fact that HIV testing is mandatory in some states for prisoners, hospital patients, marriage license applicants, etc. (Indiana HIV Advocacy Program, 1996). However, opponents argue that mandatory testing has been demonstrated to keep people away from the health care system. People avoid places where testing is mandatory since they fear the possible consequences of a positive result (e.g., loss of job, health insurance, or custody of children) (Indiana HIV Advocacy Program, 1996).

The Indiana HIV Advocacy Program believes mandatory testing creates an adversarial relationship between the individual and the health care provider. Furthermore, medical treatment for HIV requires a trusting relationship between patient and health care provider to be effective. An open and ongoing, willing relationship is required to allow for the best treatment and advice for the patient throughout the illness (Indiana HIV Advocacy Program, 1996).

> Preserving autonomy, self-determination, and active participation in care encourages pregnant women to seek and continue comprehensive pre- and post- natal care for themselves and their children. Therefore, counseling and voluntary testing with informed consent must be standard parts of any HIV testing program for pregnant women. Informed consent means that a pregnant women understands not only the procedures involved and what the results mean for the patient and her fetus, but also the range of people who may have access to her test results (Indiana HIV Advocacy Program, 1996, p.2).

Method

Sample

An interview was conducted via telephone or in person with health care professionals (i.e., physicians and nurses) who provide care for patients with HIV/AIDS. Seven RNs, five MDs, one Indiana State Representative, and one patient advocate were interviewed. A snowball sampling method was used in this study. Snowball sampling occurs in stages, beginning with a few people with the required characteristics being identified and interviewed. These people are used as informants to find other qualified people to be included in the sample. The second stage is finding and interviewing the identified people who, in turn, lead to information on other qualified individuals. This leads to the interview of the third stage and then finding other qualified people, and so on (Bailey, 1994). Other authors have recently referred to the snowball sampling as "chain referral sampling" (Biernacki and Waldorf, 1981).

Measures

The survey (Appendix A) was administered to the profes-

sionals by telelphone or by an in person interview . The answers were based on self-reports or personal experiences. The questions were developed to determine how much experience the individual had with HIV/AIDS infected patients, opinions regarding mandatory testing, and the effects of HIV testing on pregnant women, if mandated.

Experience was determined with the questions, "How long have you worked with HIV patients while being in the health care profession?", and "Of these patient, how many of them are pregnant?" Opinions were addressed in the questions, "Do you favor mandating HIV testing for pregnant women?" along with their opinions of benefits / risks for pregnant mothers and infants with the health and social aspects of mandatory HIV testing. The effects of testing are based on the questions, "If HIV testing is mandated for pregnant women, can this law be effectively enforced?" and "What would happen to the woman is she breaks the mandatory HIV testing law?"

Results

Most respondents acquired their knowledge to treat HIV/AIDS infected patients after receiving degrees and accepting positions in the health care profession. For the nurses who are dealing with infected patients, only about half of them received special training dealing with the treatment of HIV infected patients. According to one of the nurses interviewed, all new nurses are supposed to receive a training certificate relating to HIV prevention and counseling training; however, room in these classes is limited, creating a long waiting period.

Most health care workers interviewed work exclusively with HIV/AIDS patients. Those that do usually have between one and five pregnant patients. Five HIV infected pregnant patients actually constitutes a high patient load. To further this difficult situation, the number of HIV infected pregnant patients are increasing.

A large percentage of the HIV infected pregnant women have Medicaid to cover their medical costs or they are uninsured; a smaller percentage of these individuals have private insurance. All of the people interviewed stated that there are different programs to cover the medical costs if the individual in uninsured. For example, in Lafayette there are six shelters that receive a grant that pays the medical costs for all of the homeless individuals staying in the shelter at that time. If the grant funds are exhausted, the clinic still provides the services but has to absorb the economic loss. Some hospitals also have programs that can absorb some of the medical costs for those needing assistance.

The number of years the individuals in the health care profession have worked with HIV infected patients varies considerably. The range of experience is from two to fifteen years. Those professionals with fewer years of experience with HIV patients tend to have taken more specialized courses to prepare them to work with HIV infected individuals. However, very few of the individuals, even those working specifically with HIV infected persons, have patients who are pregnant as well.

Concerning the issue of voluntary testing, all facilities offer HIV testing for their patients. Most routinely offer HIV testing with counseling; however, few of the facilities said they only offer testing to those women who appear to be in a "high risk group" for being HIV positive. For those who routinely offer HIV testing, they estimate 90-95 percent of the pregnant women volunteer to have an HIV test. For the nurse who primarily works with homeless patients, the estimate is around 60 percent of the pregnant women volunteer to have an HIV test.

When the issue of mandatory testing is raised, there seems to be a line that separates the opinions of the physicians and the nurses in the medical profession. In general (about 3:2) the physicians are against mandatory testing while every nurse interviewed believes HIV testing should be mandatory. Each of the individuals interviewed had a difficult time determining how they felt about mandatory laws. The general reason why testing should not be mandatory is the fear that pregnant women will be frightened of the test and will not seek prenatal care. Another compelling reason for not mandating HIV testing is that 95 percent of the women voluntarily agree to have an HIV test, according to the social worker interviewed. The social worker felt that, mandating testing could result in alienating some of the women who volunteer to be tested from prenatal care.

For those who stated that HIV testing should be mandatory for pregnant women, there were a variety of reasons why testing should be mandatory. The most basic is that some view this as a health care issue and not a social issue. Even though the individuals struggle with the possibility of mandating testing, they view this as an issue that should be viewed in terms of public health. They feel that mandatory testing will help reduce transmission to other individuals and, with treatment, reduce the risk of transmission to the child.

All of the individuals interviewed feel a mandatory testing law could be effectively enforced. Some say this will be possible but difficult to monitor. The general view is that HIV testing will be similar to syphilis screening where there was resistance initially, yet now few people challenge testing. One of the individuals interviewed thinks the largest detriment to mandating HIV testing is the counseling aspect of the test will be eliminated. Currently, if a person is screened for HIV, the person receives counseling to assist with coping with the stress of the test. The fear is that the counseling will be eliminated and this will become a routine test, therefore people will not have the important counseling they need.

Discrimination is another issue that must be dealt with when dealing with HIV and pregnant women. Several of those interviewed were quick to state that HIV positive individuals are protected under law and it is illegal to discriminate based on HIV status. However, some admitted discrimination is still possible in subtle forms. Several types of discrimination are possible; initially, there is the

chance confidentiality would be broken. Many people currently have access to patient health records, increasing the chance of private information being made public. Women may also have a difficult time finding health care since many insurance companies do not want the financial burden or liability of an HIV/AIDS client. This issue is even more serious when the women may not have the funds for adequate prenatal care. In addition, there are still some health care workers who do not wish to have HIV infected patients.

The potential benefits for the pregnant woman being tested for HIV are great. If a woman is tested during pregnancy and found to be HIV positive, she would be able to take better care of her health and have access to the pertinent and necessary medical treatment. This situation would translate to the child potentially being healthier. The knowledge of her HIV status allows time for the mother to plan for the future (hers as well as the child's, physically and socially) by creating support systems. Throughout communities and the country, a large support system has developed and is available to all that want or need it. Most importantly, the early detection of the HIV virus through testing will allow the woman to implement lifestyle changes to prevent the disease from being spread even further through the community.

Most felt there were few risks involved with testing; most of the risks that exist are social risks. Some of the basic concerns relating to testing are that people may not have access to adequate health care. They may also face discrimination with their treatment and even lose their insurance. One of the social risks is the possible feeling of loss of control. The individuals may face discrimination from their family and or community due to the financial burden and burden of health demands from the mother and the child. The woman may also have severe psychological problems due to a positive test result. Also, the individual may have to give up her lifestyle and possessions (such as their home and car) in order to qualify for Medicaid to continue treatment.

After assessing the potential benefits and risks for health and social aspects of HIV testing for pregnant women, the issue of mandating testing was discussed again. Most of the people who felt testing should be mandatory never stopped to consider the repercussions of refusing to comply with the mandatory HIV testing. Most interviewed felt it would be possible to police a law mandating HIV testing, while some did not think this is entirely possible.

Again, physicians and nurses are divided on this issue. The nurses believe that it will fall upon the pregnant women to comply with the law. They feel that if the woman does not comply, she will face the consequences. The nurses felt that possible consequences are: abuse and neglect charges, refusal of physicians to give prenatal care, testing against her will when the mother arrives in the hospital for delivery, or a public health nurse sent to the person's home to draw blood. In contradiction to previous findings, a minority of those interviewed felt that no legal repercussions for the woman would exist. Most of the physicians interviewed believe this law will affect how they provide prenatal care. This means, HIV testing will be routine with all of the other prenatal tests given and failure to comply will be a civil charge against the doctor. Currently, there are no Indiana state laws surrounding this issue. Yet, the state representative feels that the law and penalties will probably fall on the physicians.

Discussion

As the study indicates, a wide range of opinions exist on the issue of mandatory HIV testing for pregnant women. This study was limited to those health care professionals and advocates that have worked directly with HIV patients. Since each person interviewed has training in caring for HIV/AIDS patients (either on the job or through formal courses), they provide important insights into the debate concerning whether HIV testing should be voluntary or mandatory.

Discrimination does not appear to be the overriding issue of concern. As several nurses and physicians were quick to point out, discrimination is illegal. However, most acknowledged the concern that subtle forms of discrimination may occur. For example, loss of health care, insurance, family, and support is still the main issue to overcome when attempting to convince pregnant women to have an HIV test. The current standards of confidentiality appear to be adequate in maintaining confidentiality in Indiana since neither the public nor the employer have access to this information. The power of disclosure is given to the patient.

The results indicate there are several benefits and risks for a pregnant woman to be tested. However, the consensus was, regardless of the potential risks of HIV testing, the benefits far outweigh the risks. Even though mandatory testing is perceived negatively, the possibilities and benefits of voluntarily testing for the disease are immense. Not only will individuals know their HIV status and begin treatment to improve the quality of their own life, individuals can also begin treatment to prevent the spread of infection to the unborn child.

The social aspects do not seem to weigh as heavily in determining what would be most beneficial for the patient. However, the implications are clear that social factors do play a role in determining the mental and physical health of the mother, translating into the health of the child. Several social services are available to the public and it is clear that professionals view them as beneficial for all who need additional support.

If HIV testing becomes mandatory for pregnant women, even the professional community is uncertain what would happen to the mothers who are not tested. What should be done about the laws and how programs should be implemented is still uncertain. Even though policing mandatory testing is believed possible, it would be difficult to implement the law. Although opinions are divided regarding the consequences of disobeying the laws, some professionals

feel that mandatory testing will become necessary in the future, especially since the number of pregnant women who are HIV-positive is increasing. Ideally, women would volunteer to be tested and not have to be coerced or compelled to undergo testing against their wishes. Many professionals believe this is a medical issue and not a social one; which means, mandating HIV testing for pregnant women may be necessary even though it is not ideal.

If testing becomes mandatory, the health care professionals fear fewer women will seek prenatal care and other necessary health care due to fear of mandatory testing. The major concern is that forcing women to be tested may cause more problems than currently exist. However, since a number of states, including Indiana, are considering mandatory testing laws, the consequences of such laws need to be examined. This study was designed as preliminary research attempting to discover the attitudes of health care professionals who work with HIV/AIDS infected patients. Further research needs to be conducted to better understand the results if mandatory testing laws are legislated.

One issue that should be examined further is the issue of accuracy. There is a window that exists where infection can not be detected. Thus, how many pregnant women will test negative and not have access to care essential in reducing the risk of transmission to her child? Further studies should be conducted to investigate how many cases of pediatric HIV infection will be prevented if laws are implemented.

Another issue is one of economics. Who will pay for the tests? Will the individual, insurance companies, or government pay for the counseling and testing procedures? Will some standard practices, as the pre-testing counseling, be eliminated to save money? How will testing laws be effectively enforced? How will the money be raised? Will taxes go up on the state or federal level to cover the expenses? Many states have a difficult time finding adequate resources for programs that are currently in effect. Some assistance would be necessary for those people who lack the funds for the testing that would have to be conducted, according to the law. In addition, what will be the monetary difference when comparing the cost of testing for all pregnant women to the costs of medical bills for the number of individuals infected under the current system. How many people will benefit from this procedure?

The other main issue that should be examined is how the general public will react to mandatory testing. Before implementing new laws, public opinion should be considered. Attitudes toward the following questions should be determined: (1) Do people believe more should be done to prevent infants from receiving the infection from the mothers? (2) Does the public believe that it is ethical to force HIV upon pregnant women? (3) Does the public believe (through access to adequate information) that the public will benefit from testing as a whole? (4) Will the public comply with the testing? and (5) Will the public agree with the method of funding the expenses of mandatory testing? Ploughman (1995/1996) researched some of these issues, yet a more detailed analysis in Indiana needs to be conducted.

Only by understanding the situation to the fullest potential and estimating the outcomes given each scenario, can the public, specifically pregnant women, receive the full benefits of the health care system. Currently, in the state of Indiana, people are not ready for mandatory testing even though the health care professionals are ready to institute it. Only through compassion, and further research, can more answers and a better future be available for women and their children.

Acknowledgement

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Table 1. Cumulative Number of children in Indiana born to HIV infected mothers (Though March 31, 1997)

Race	Exposed	HIV	AIDS	Reverter	TOTAL
White	19	8	11	17	55 (44%)
Black	19	11	12	14	56 (44%)
Multi	5	2	3	2	12 (10%)
Other	3	-	-	-	3 (2%)
Total	**46**	**21**	**26**	**33**	**126**

(Taken from ISDH, 1997)

Appendix A

Questions for Health Care Workers With HIV Infected Patients:

ID number _____

Gender _____ Age _____ Race _____

What is your health care position or title?

Did your health care training include a specialized course(s) dealing with treatment of HIV infected patients? If yes, did the training include information on the social aspects relating to HIV issues?

What proportion of your patients are covered under health insurance? What types of insurance do they have (e.g., private insurance, Medicaid, etc.)

How long have you worked with HIV patients while being in the health care profession?

How many of your patients are HIV infected?

Of these patients, how many of them are pregnant?

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What services do you provide for your patients?

Do you favor mandating HIV testing for pregnant women?

What is your perception of how patients feel about mandating HIV testing?

Do you routinely offer HIV testing for pregnant women?

What proportion of pregnant women voluntarily have an HIV test?

If the mothers are tested, what forms of discrimination do they face (e.g., with employment and insurance)?

What are the potential health benefits and risks with testing for HIV in pregnant women?

What are the potential social benefits and risks with testing for HIV in pregnant women?

If HIV testing is mandated for pregnant women, can this law be effectively enforced?

What would happen to the woman is she breaks the mandatory HIV testing law?

Do you know other health care professionals I may contact and ask these questions?

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HIV Infection in Diverse Rural Populations: Migrant Farm Workers in Indiana

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Abstract

In the United States, infection with the human immunodeficiency virus, HIV, continues to rise disproportionately in populations of color. According to the U.S. 1990 Census, 12% of the US population was African-American. Among cumulative AIDS cases, 35% have been African-American and 18% have been Hispanic. While attention has focused on urban populations, particularly the poor and intravenous drug users, other groups have been less well studied. Among these are migrant and seasonal farm workers. Overcrowding, low wages, low literacy rates and poor access to health care are common among farm workers. These conditions are associated with high rates of transmission of HIV in other populations.

The scope of HIV infection among migrant field workers is difficult to determine. Few groups have studied this population which is valued for its high intensity seasonal work. The United States is currently home to 200 million people, 63% of whom work. It has been estimated that 2.7 to 4.0 million persons in the United States were classified as migrant or seasonal farm workers (Farmworkers Justice Fund 1986). The economic contribution of these workers is enormous. Over 85% of the fruits and vegetables produced in this country in the past 10 years have been hand harvested and or cultivated with a large contribution by such workers. One study has shown that eliminating the presence of farmworkers or switching to less labor intensive crops has a negative impact on regions and can reduce the number of jobs available to permanent local residents (Sills, Alwang & Driscoll, 1993). Nevertheless, possibly because of the transient nature of seasonal and migrant farm workers, the number of currently infected workers nationwide is not well known. What follows is a summary of small studies published either in peer reviewed publications, national institutional newsletters or other publications or available via the Internet.

Migrant and Seasonal Workers: Who Are They

The definitions of migrant workers and seasonal workers are often not explicitly stated. In one study of HIV infection among farm workers in South Carolina, seasonal farmworkers were defined as persons who performed farm work for an aggregate of 25 or more days during the past 12 months, earned at least half of their income from farm work and were not employed in farm work year round by the same employer. Migrant workers were defined as those seasonal workers who were unable to return to their residence within the same workday (Jones et al., 1991). Although other definitions have been applied to enumeration of farmworkers for different purposes, for the purposes of this article the above definition is useful as it reflects the interrelated nature of seasonal and migrant workers and the variability of their working lives.

The U.S. Department of Labor's National Agricultural Workers Survey (NAWS) conducted between 1989 and 1990, estimates the number of migrant and seasonal farmworkers in the United States to be between 2.8 and 4 million (U.S. Dept of Labor, 1990, Mishra, Conner & Magna, 1996). According to the National Center for Farmworker Health (NCFH, 1997) the demographics of the migrant population are diverse and vary by region. NCFH reports that approximately 85% of all migrant workers are minorities. The most common group among these is Hispanic (including Mexican-Americans as well as Mexicans, Puerto Ricans, Cubans, and workers from Central and South America). In addition, migrants are also Black Americans, Jamaicans, Haitians, Laotians, Thais, and other racial and ethnic minorities. Published estimates of the numbers of farm workers in Indiana are limited. Data from the Indiana Health Centers, a private not-for-profit health provider organization that runs the clinics that serve migrant and seasonal farm workers in the state of Indiana, suggest that there are approximately 9000 such workers in the state. As is the case in much of the U.S., Indiana's migrant and seasonal farm workers are predominantly Hispanic (96% in 1996). Fifty-seven percent need an interpreter, even though most are U.S. citizens, particularly from Texas (Indiana Health Centers Annual Report: 1996). The observation that many farmworkers are U.S. citizens or are working in this country legally is in agreement with the observations of others nationally.

Three streams of migration of farmworkers have been defined that identify major routes along which farmworkers travel. These patterns of migration depend on a number of variable factors influencing the availability of farmwork and overlap among them certainly occurs. The East Coast stream originates in southwestern Florida and migrates along the Atlantic coast to New York state. This stream is the most ethnically diverse including a higher proportion of African Americans as well as Mexican Americans, Mexicans, Puerto

Ricans, Haitians and Jamaicans. The Midwest stream originates in Texas, is primarily Latino and migrates towards Michigan and Iowa. The West Coast stream originates in California, is primarily Mexican Latinos and extends north to the states of Arizona, Idaho, Oregon and Washington. California is the origin of the largest number of U.S. farmworkers (Mishra, 1996). Availability of housing, cultural lifestyle and working conditions vary among these streams. For example, along the East Coast migrant workers are less likely to live in temporary housing. In contrast, in California, most workers live in unregistered make-shift housing that is often overcrowded with little regard for safety regulations. Indiana, at least for the purposes of classification in some studies is included in the East Coast stream (for example Skendal, Cited in Mishra 1996).

In 1996, in Indiana, 94% of workers had income levels at or below the poverty level in agreement with national figures cited by the Department of Agriculture that half earn less than $7500/year (Oliveira, Runyan & Hamm, 1993). Fifty-eight percent of workers have never been married and another 19% are not currently married.

Although some workers must live apart from their families and may travel, work, and live in groups of single men, in the Midwest, in general, and in Indiana, in particular, migrant workers often travel with their entire family. It is estimated that Indiana's farm workers bring with them approximately 3500 children. It may be because of this family setting that Indiana's workers are considered to be at low risk. The perception of low risk is not accurate but one which is not unique to Indiana.

Children present a special consideration in terms of prevention of sexually transmitted diseases and HIV infection. Adolescents, in particular, have a long history of being at the highest risk for infections such as gonorrhea and *Chlamydia trachomatis* genital tract infection. For example, in Indiana, adolescents from ages 15 to 19 years old accounted for 33% of all gonorrhea cases and 45% chlamydial infection in the first quarter of 1997 (Indiana State Department of Health, 1997). Adolescents are particularly vulnerable because of their sense of immortality, their risk taking behaviors and their developing sexuality. Nationwide, intensive efforts have been made to develop strategies for changing their behaviors and to provide education on prevention of AIDS and STDs. Such preventative strategies are a major focus of the Rural Center for STD/AIDS Prevention (RCAP)(aids@indiana.edu).

Basic education of a migrant child is particularly difficult, however, aside from AIDS/STD prevention. Because curriculums often vary between schools and districts, the frequent moves these children experience make the normal continuity needed for learning impossible. Imagine being a teacher and trying to develop instruction in a class with a large number of migrant children. Not only do the children come with language barriers and individual difficulties related to frequent moves, but also the large shifts in classroom populations make teaching challenging. It is not surprising, therefore, that the NCFH (date) notes that the median educational level for the head of a migrant household was 6 years in 1986, or that 55% graduate high school, a number that represents an increase in recent years.

Economic pressures also encourage children to drop out of school. Low family wages result in a need to include children's work in the family income. Agriculture, unlike any other industry, allows children under the age of 16 to work. As noted by the NCFH, although the Fair Labor Standards Act sets age 12 as the legal limit for farm work, with exemptions available for children as young as 10 or 11, many children under age 12 continue to do farm work. A 1988 survey of parents who were hired farm workers in six states found that about a third of the parents interviewed had children working in the fields.

Despite barriers there has been progress. Programs like the Migrant Head Start Program(mhstasc.org), a federally funded program, provide educational services to migrant preschool children. (A web site for the associated technical assistance program is mhstasc.org). Programs specifically designed for farmworker families have had some success in overcoming deep family ties to allow children to stay in school when family members migrate. Allowing children to remain in school has been associated with higher rates of graduation from high school, as noted above. The impact of the separation on behavior and sexual practices is unknown.

Migrant and seasonal farmworkers and their children have little access to health care despite the highest work-related mortality in the nation. Farmwork is associated with high rates of pesticide exposure and trauma-related illnesses. Furthermore, the setting in which migrants find themselves predispose them to a variety of infectious diseases, a fact that, in part, led to the establishment of the Migrant Health Program, a grant program which grew from the 1962 Migrant Health Act and is funded through the U.S. Public Health Service. Nevertheless, even in areas with available health care, farmworkers are unlikely to seek healthcare because of loss of wages and time restraints. In addition, illegal immigrants are not eligible to receive most forms of public assistance (America's Farmworkers Home Page 1997). Lack of consistent health care has made studies of HIV infection and its dynamics within seasonal farmworker population difficult. Compounding the problem is the poorly defined risks and extent of HIV infection and sexually transmitted diseases among farmworker women and children whose participation in the workforce differs from their male counterparts.

HIV Infection in Seasonal and Migrant Workers

Deriving information on the incidence of HIV infection among seasonal and migrant workers is difficult. First, it requires that workers come in to be tested, a process which leads missing work and income. Second, until recently, testing required time and a return visit. Given the transient nature of employment as well as, again, the loss of income,

few workers are likely to return for test results. A third difficulty is communicating the importance of testing and educating workers about HIV and last is the issue of what to do or what would happen if a test is positive. Lastly, interpreting the results of studies requires careful attention to the population tested in relationship to gender, cultural background, and geographic location in relation to potential sources of exposure.

Nevertheless, several studies have examined rates of infection among migrant and seasonal workers. As a group, they suggest that the rate of infection is higher than in counterpart white populations and increasing.

Among the most useful is a 1992 study of HIV infection, syphilis and tuberculosis (TB). The Florida Department of Health and Rehabilitative Services (FDHRS) screened for the three diseases among workers from 15 migrant camps in Immokalee, Florida (CDC, 1992). The period studied, From February 1 to March 31, 1992 was chosen because it is when Florida's perishable crops are in season and the time when the number of migrant workers peaks. Outreach recruited volunteers from the camps by going door to door. Testing was done after work hours to facilitate participation. Volunteers gave blood for HIV and syphilis serologic testing and received TB skin tests at their first visit and returned 48-72 hours afterwards to obtain serologic results and for their TB skin tests to be read. HIV serologies were tested by ELISA with confirmatory Western blot or immunofluorescent assay. Sixty percent of camp residents participated in the study and 86% of these returned for follow-up. Forty-four percent had positive TB skin tests; 8% were seropositive for syphilis and 5% were HIV positive. HIV seropositivity was more likely if individuals were born in the United States. Almost all of the positive tests were new diagnoses of HIV infection. IV drug use and men having sex with men were rarely reported. The highest reported risk was among those who had more than 2 sex partners in the past 6 months and those who had a history of syphilis. Syphilis seropositivity was highest among those who had used crack cocaine. The HIV seroprevalence observed in the 1992 Florida study is higher than that reported among residents of nearby Belle Glade Florida or in North Carolina's farm workers in 1987 (CDC 1988, Morbidity and Mortality Weekly Report, 1988). Belle Glade is a community that was investigated by the CDC ports. Clearly this is supported by isolated studies from both the CDC and elsewhere. Although foreign farmworkers receive little in the way of healthcare, the importation of AIDS to their places of origin may have devastating effects. It has been reported that 25% of AIDS cases in Mexico have worked for prolonged periods in the United States (Cited in Melba, Bacz-Villasenor, Guzman, Figueroa, 1996). Furthermore, as noted previously, most farmworkers are U.S. citizens and will receive AIDS care in the U.S.

HIV Prevention

Prevention of HIV infection is dependent a thorough understanding of the dynamics of HIV infection in a target population. Specifically developed educational programs and interventions aimed at the changing of risky behaviors are likely to be the most successful as noted by organizations such as the multicultural AIDS Resource Center of California (MARCC), a division of POLARIS Research and Development, Inc. in San Francisco, CA (www.polarisinc.com/~marcc).

Recent studies have examined the attitudes and practices of migrant and seasonal farmworkers. Several of these studies which apply to Latino farmworkers have been published in a 1996 book entitled *AIDS Crossing Borders: The Spread of HIV among Migrant Latinos* compiled and edited by Mishra, Conner and Magana. In particular, attention is given to the greatest risky behavior in this population, sexuality. Interviews with health care providers, social scientists, residents of regions from which migrants originate and migrants themselves support a view that taboos around sexuality are unique in this population. The stigma attached to men having sex with men is high and may result in an underreporting of anal intercourse among men as a risky behavior. Furthermore, the ability of women to communicate their need to protect themselves may be limited. This view is also supported by observations made by the Farmworkers Women's Initiative and the National Commission to Prevent Infant Mortality who have noted culturally based behaviors which make it difficult for farmworker women to protect themselves (U.S. Department of Health and Human Services, 1995, National Commission to Prevent Infant Mortality, 1993). Several studies have also noted a high prevalence of sexual encounters with sex workers as well as a low prevalence of condom use (For example: Ayala, Carrier, & Magana, 1996 and Ferreira-Pinto, Ramos, & Shedlin, 1996 and CDC, 1992). The extent of sex worker related sexual relations is not well documented, particularly in camps with high numbers of single men.

Thus the development of programs based on these limited observations is challenging. Furthermore, evaluation of prevention programs is especially difficult in migrant workers where long term follow-up is difficult. Nevertheless, there is some evidence that such programs may be effective. In one study of Latino migrant workers, an AIDS educational program that consisted of a Spanish language photo story book and a radio story teaching about AIDS was administered to Spanish speaking migrant farm workers (Mishra, Conner & Lewis, 1996). The book and the radio story outlined modes of transmission, risk factors and methods of prevention. The major prevention method taught by these lessons was condom use during sex with sex workers. Participants were surveyed before (pre-test) and after program administration (post-test)and received the program within a three week period between the pre and post testing dates. Fifty-two individuals who received the program were compared with 37 who did not. Those who received the program were more likely to report use of a condom during sex with a sex worker at the time of the post test (pre-test:

7%, post-test 65%, p = .001). When questioned at either the pre-test or post-test visit, none of the control group reported use of a condom during sex with a sex worker. Thus at least in the short term, education may change behavior of Latino migrant workers.

Because so little attention has focused on HIV in seasonal and migrant populations, much remains to be done in terms of understanding the epidemic in this population before HIV prevention efforts are optimized. Innovative programs those described above and others such as the use computerized databases to track migrant workers with tuberculosis need to be implemented and others customized to reach this risk, valuable and vulnerable rural population.

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New Drugs for Treatment for AIDS and Cost Implications

Stephen R. Byrn, Ph.D., James G. Anderson, Ph.D., Marilyn B. Anderson, B.A.

Abstract

The development of drugs to treat HIV/AIDS is a story of how the pharmaceutical industry in the United States has been able to respond to a major medical crisis. It is a story of how physicians were able to apply the concept of combination therapy to treating AIDS patients and attacking the AIDS virus. It is a developing story of how the nation can finance health care costs. It is a story of how AIDS education continues to play the central role in prevention. Finally, it is a story of how professionals from a wide range of disciplines can address a major and serious public health problem.

This paper describes new combination therapies that are providing exciting clinical results. However, it is clear that these therapies are not a cure. Furthermore, resistance is a potential problem whose significance has not been assessed. Most importantly, this paper shows that the new therapies will increase the costs of AIDs therapy. Clearly, the increased costs of new therapies will pose a major problem for the state and the nation. The costs of prevention are much lower and, in addition, prevention will greatly reduce the cost in human suffering.

Discovery of Anti-AIDS Drugs: The Response of the Pharmaceutical Industry

As soon as the AIDS virus was identified, a major effort was made to develop a cell culture method to screen for anti-AIDS drugs. This is crucial to discovering anti-viral drugs. A cell culture method was rapidly developed and instituted at both government laboratories and private industry. Initially, NIH provided free screening for anti-AIDS agents to companies and Burroughs Wellcome discovered AZT, the first anti-AIDS drug to be approved using the NIH screening laboratories. However, many companies rapidly developed their own internal screening procedures and these procedures have led to the discovery of most of the other anti-HIV drugs. When the government sued Burroughs Wellcome over the patent on AZT, the positive relationship between government and industry ended, and essentially all companies continue their research without government support or input. From the start, most pharmaceutical companies emphasized discovering new drugs for the treatment of AIDS rather than vaccine development. This is probably because companies knew that anti-HIV drugs were feasible and doubted the ability to develop a vaccine against such a genetically active virus.

As a side note, it is interesting to contrast the approach of the pharmaceutical companies to that of the National Institutes of Health and other government bodies. The government emphasized the importance of vaccines and placed major funding emphasis on vaccines. In the early days a few drug discovery groups were funded for a short time (3 years) at relatively low levels. But these centers were generally not renewed after 3 to 5 years and increased emphasis was placed on vaccine development by NIH. In fact, in recent years the government has indicated virtually no interest in the development of anti-viral agents. One government report suggested that all government funding for anti-AIDS discovery should be stopped since no anti-AIDS drugs had been discovered by the government. Thus, the government continues to spend over one billion per year on vaccine development despite the fact that a vaccine is years away and would be extremely difficult to test. No vaccines are even being tested in humans at this time. To summarize, it is fortunate that the pharmaceutical industry emphasized drug discovery and development. Without their pioneering efforts many more lives would have been lost.

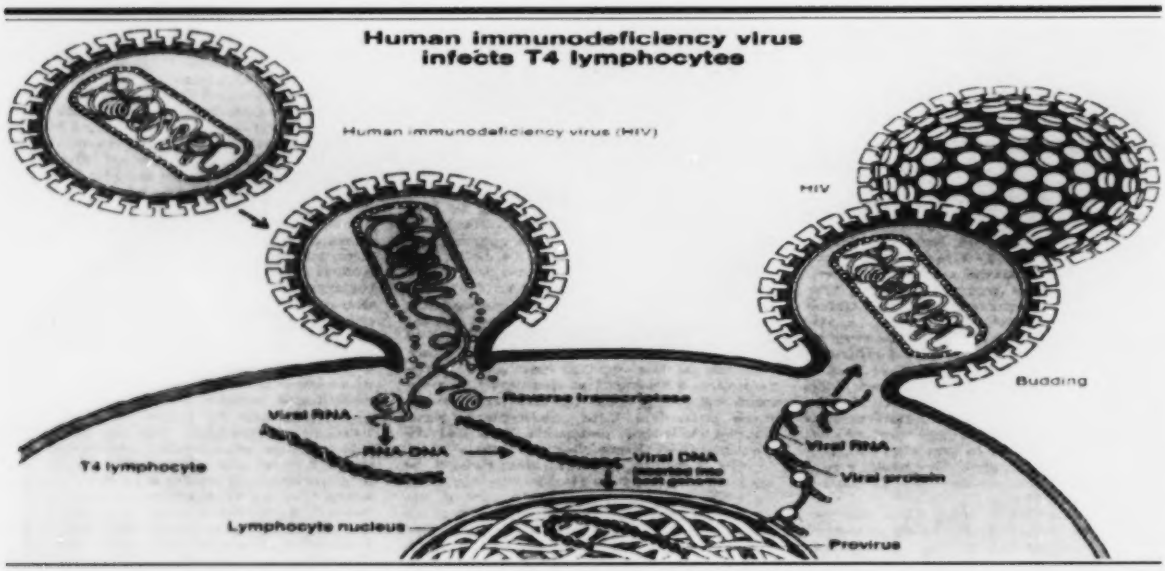
How New Anti-AIDS Drugs are Discovered

Figure 1 shows a diagram of the life cycle of the AIDS virus. As soon as this life cycle was established, drug discovery scientists began focusing on targets for attack and destruction of the virus. Many researchers felt they were on a mission to develop new weapons to attack the virus (the enemy). Most researchers worked long hours in their quest for the latest molecule to "gun down" the HIV virus. Some of the favorite target were:

(1). Reverse Transcriptase
(2). Viral Protease
(3). Viral Integrase
(4). Coating/Uncoating
(5). Fusion

Reverse transcriptase is an obvious target because this step is unique to the virus. Reverse transcription involves enzymatic synthesis of a DNA copy of the RNA viral genetic information. The enzyme reverse transcription is unique to the virus and its synthesis of DNA is inhibited by the DNA chain terminator AZT and five other nucleotide analogs.

Clearly this is the favorite target of drug discovery scien-



tists. The discovery of AZT and the dramatic halt of clinical trials and immediate approval of AZT really cemented the idea that reverse transciptase is the #1 target for development of antiviral agents.

Protease emerged as another prime target. Much was known about developing inhibitors for endogenous proteases in the body. Thus it seemed relatively simple to develop specific inhibitors for viral proteases. Indeed, the gene for the viral protease was cloned and large amounts of the enzyme became available. This allowed crystallization of the viral protease. Once the protease was crystallized, its structure and coordinates became available. Furthermore, its structure could be displayed and analyzed. Then potential inhibitors can be docked with the protease using modern computer graphics equipment.

Much effort was made, at this stage, to get the best fit of the inhibitor with the receptor. This usually involved optimizing the hydrogen bonding and non-covalent interactions between the inhibitor and the protease. This approach has been used to discover and develop three protease inhibitors. These drugs are structurally different and have different activities.

A third very important target in the AIDS viral life cycle is the viral integrase enzyme. Like reverse transciptase and protease, this enzyme is unique to the virus. It is involved in integrating the DNA copy produced by reverse transcriptase into the host genome. When the AIDS virus was discovered, little was known about integrases, thus therapies attacking this enzyme have taken longer to develop. Nevertheless this is an important target which will hopefully be explored in the future.

Combination Therapy

The idea for combination therapy has been well accepted for many years in medical circles. Physicians have used combinations to treat infectious diseases and there are even combination drugs which are marketed. In addition, combination therapy has been used for cancer treatment with some success.

Combination therapy for the treatment of HIV is particularly attractive. Attack of the virus at different steps in the life cycle should be more effective than attack at a single step. Several combination drugs have been marketed. In addition, combination therapy has been used for cancer treatment with some success.

Combination therapy for the treatment of HIV is particularly attractive. Attack of the virus at different steps in the life cycle should be more effective than attack at a single step. Several combinations of drugs have been tried. Initial combinations involved two nucleoside reverse transcriptase inhibitors. These were marginally effective and continue to be used. Another type of combination involves using both nucleoside and non-nucleoside reverse transciptase inhibitors. Theses are also effective and of continued interest.

Recently, protease inhibitors became available. Combination of protease inhibitors with each other have been used with success.

Combinations of reverse transcriptase inhibitors and protease inhibitors provide a startling reduction in viral levels in AIDS patients. These combinations have resulted in remissions of the progression of HIV infection and have been widely publicized in Time and Newsweek. These are the combinations that have reduced viral levels to zero in some patients.

Combination-Drug Therapies

Recent clinical trials involving over 2,400 HIV-infected persons with CD4 cell counts between 200 and 500 cells per cubic millimeter show that antiretroviral therapy delays the progression of the disease to AIDS and reduced mortality

(Hammer et al., 1996; Katzenstein, et al., 1996). The combination of zidovudine and idanosine in particular among patients new to antiretroviral therapy reduced the rate of progression to AIDS or death by 39 to 51 percent compared to patients treated with only zidovudine. However, a longitudinal cohort study by Graham (1996) found that patients who changed to combination therapy during the intermediate stage of HIV infection by adding didanosine or zalcitabine to zidovudine prolonged survival by only 3 to 6 months. Recent studies with reverse-transcriptase inhibitors and a protease inhibitor have resulted in prolonged reductions in plasma HIV RNA concentrations (Markowitz et al., 1996; Schapiro, et al., 1996).

There are currently ten drugs that can be used in various combinations to treat HIV-infected patients. While there is a strong rationale for early detection or infection and initiation of treatment, it is still unclear as to the best point during the progression of the disease to begin combination drug therapy. Also, clinical trials are needed to determine the effects of treatment on progression to AIDS and death (Corey and Homes, 1996).

Persons with HIV or AIDS enrolled in the Indiana AIDS Drug Assistance Program (ADAP) were surveyed with a total of 111 persons responding. Figure 2 shows the current drugs that they are taking. Over three-fourths of the respondents indicated that they are currently receiving a combination of drugs. Thirteen percent are only receiving one drug while another 11 percent indicated they weren't receiving any drugs or didn't know how many different drugs they were taking. When asked whether they were currently taking a protease inhibitor, only about a third of the respondents said yes (see Figure 3). About three percent didn't know.

Figure 2

Survey of ADAP/EIP Clients (N=111)
Drugs you are currently taking

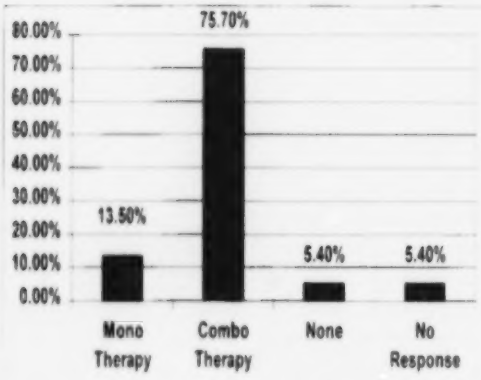
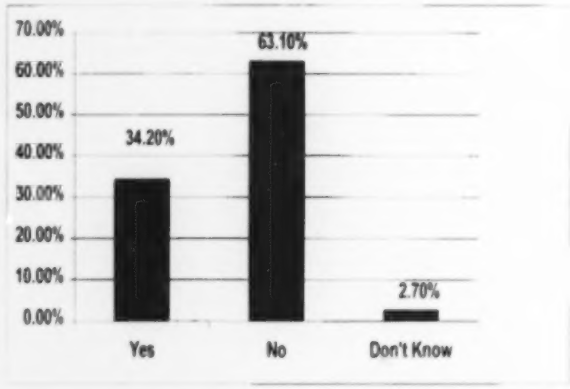


Figure 3

Survey of ADAP/EIP Clients (N=111)
Are you taking a protease inhibitor?



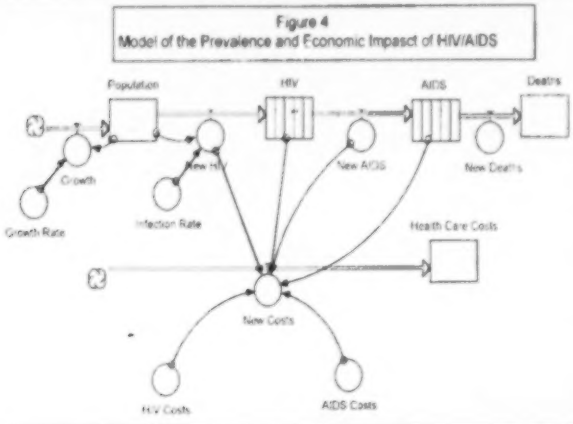
In this paper we report a computer-simulation model that estimates the number of persons in Indiana living with HIV and AIDS at each point in time from 1995 to the year 2015. The model also estimates the cumulative number of HIV-related deaths and costs of health care. The model is used to predict the effects of the new combined-drug therapies on the prevalence of HIV/AIDS and health care costs. Three different predictions are made for each year. The first prediction assumes that current treatment protocols are used. The second prediction assumes that combination-drug therapy involving both reverse transcriptase and protease inhibitors is begun when an HIV-infected person is first diagnosed with AIDS. The third prediction assumes that combination-drug therapy is initiated as soon as a person is diagnosed as seropositiave.

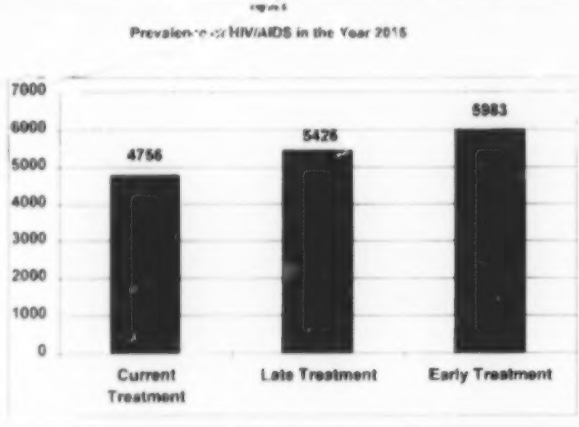
The Computer Simulation Model

A model of the progression of the HIV disease and the medical costs associated with its treatment has been constructed using STELLA, a computer simulation software package (Anderson, 1995; Hannon and Ruth, 1994). The model shown in Figure 4 is based on an earlier one developed by Anderson and Anderson (1996). Details about the model's construction are reported in Anderson and Anderson (1997).

The model was initiated with data from the year 1995. According to the Indiana State Department of Health (1996b), there were 2,6980 persons in the state living with HIV and 1,544 residents of the state had died from HIV/AIDS. The population of Indiana in 1995 was estimated to be 5,775,806. A new HIV infection rate of 6.3 cases per 200,000 population is assumed. The rate is based on surveillance data collected by the Indiana State Department of Health (1996a).

HIV-infected persons on the average live 10.3 years before being diagnosed with AIDS symptoms. This diagnosis





is based on the presence of an AIDS defining opportunistic disease. The mean survival time for patients in the AIDS stage is 25 months or 2.08 years. These estimates are based on data from the San Francisco Mens Health Study and New York AIDS patient survival data (Hellinger, 1993). Since there is variation in the stage of the disease when a patient is first diagnosed as HIV positive as well as in the time that it takes to progress to AIDS and death, the model assumes a normal distribution with a mean occupancy time of ten years and a standard deviation of two years before an HIV infected individual is diagnosed with AIDS. The survival time for AIDS patients is assumed to be normally distributed with a mean of 2 years and a standard deviation of one year.

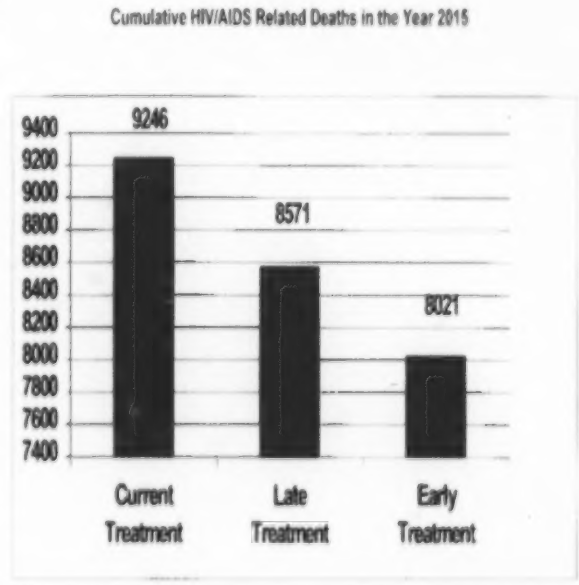
Annual treatment costs are in 1995 dollars and are taken from Gable (1996) recent estimates based on treatment protocols. Protocols, identified from the literature and an HIV/AIDS Physician Panel, defined the resource use associated with antiretroviral therapy and opportunistic disease prophylaxis and treatment. Resource use includes diagnostic techniques, pharmaceutical therapy, physician visits, hospitalization, emergency services, home care, specialists consultation, laboratory tests, and follow-up care. The annual cost of treating patients in the HIV stage was assumed to be $4,100 while the annual treatment costs of AIDS patients was assumed to be $25,239.

Predicted Prevalence and Treatment Costs of HIV/AIDS

Figure 5 shows the predicted prevalence of the disease in the year 2015. Under current treatment protocols it is predicted that there will be 4,756 persons living in Indiana with HIV or AIDS. If the new combination drug therapies that include protease inhibitors are initiated when a diagnosis of AIDS is made, it is predicted that the prevalence of HIV/AIDS will rise to 5,426. Early treatment as soon as individuals are diagnosed as HIV-positive with the combination of drugs could push the prevalence of the disease even higher to 5,983 persons by the year 2015.

Figure 6 shows the predicted effect of the new treatment regimen on AIDS-related mortality in the state of Indiana. Under current treatment protocols, the cumulative number of deaths form AIDS is predicted to reach 9,246 by the year 2015. The combination-drug therapy could reduce these deaths to as low as 8,021 depending upon when the therapy is begun.

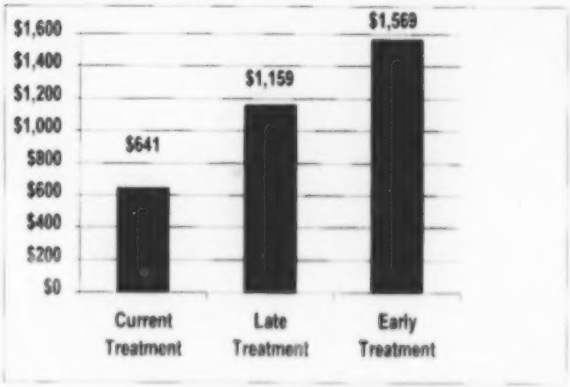
Figure 7 shows the predicted cost of treating HIV/AIDS during the period from 1995 to 2015. Current treatment costs are predicted to be $641 million during this period. If combination drug therapy is initiated for patients diagnosed with AIDS, treatment costs are predicted to almost double to $1,159 million. Earlier-treatment with the drug combinations could boost treatment costs to $1,569 by the year 2015.



In general, depending upon when therapy is begun, the model estimates that as many as 1,200 additional residents of Indiana will be living with the disease by the year 2015. Treatment costs are estimated to be over $1.5 billion (1995 dollars) during this 20 year period.

Figure 7

Health Care Treatment Costs in the Year 2015
(In Millions)



Discussion

The model presented here is preliminary and requires additional validation. The incidence and prevalence of HIV and AIDS are based on cases reported to the Indiana State Department of Health and are known to underestimate the true rates. According to CDC estimates (ISDH 1996b), the true prevalence HIV/Aids cases may be two to three times the prevalence rates used as starting values for the simulations.

Normal distributions have been used for the time from diagnosis of HIV to AIDS and the survival time of AIDS patients. In the future, data that is being collected by the Indiana State Department of Health can be used to empirically determine both the distributions and parameters for these occupancy times.

While recent studies indicate combination-drug therapies delay the progression of the disease and reduce mortality in the short-term, clinical trials are needed to determine the long-term outcomes of these therapies. The effects of combination-drug therapies on treatment costs is unknown at present. The estimates used for the simulations presented in this study are based on reasonable assumptions. Regardless of the assumptions, it is clear that the costs of care for HIV/AIDS patients will continue to rise significantly over the next twenty years.

Importance of Prevention

The costs of the new AIDS therapies are quite high and pose a major public health problem. In fact, based on our simulations it is possible that the Nation will be unable to afford these increased costs. For this reason, our prevention and education efforts much be increased. Otherwise, the nation will be faced with tremendous costs. Clearly, the costs of treatment dwarfs the costs of education and prevention and, of course, prevention leads to a far better quality of life.

Acknowledgment

This research was supported in part by the Rural Center for AIDS/STD Prevention. We wish to thank the Division of HIV/STD, Indiana State Department of Health for providing data for this study and ICAAN for the survey data for ADAP/EIP clients. Figure 1 is taken from Baum (1987) and Figure 4 from Anderson and Anderson (1997).

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Behavior Intention and Use of Condoms for HIV/AIDS Prevention Among Rural African-American Students

Andrew Kanu, H.S.D., CHES

Abstract

The subjects were comprised of 524 (18-22 year old) African-American (AA) undergraduate college students, consisting of 287 females and 237 males. The subjects were investigated to determine whether attitudes, subjective norms, and perceived behavioral control influenced their behavioral intention to use condoms, and if there was any relationship between age, religiosity, and class level in predicting behavioral intention. Open ended questions were developed to elicit important salient beliefs regarding condom use by AA college students. These beliefs, solicited from AA students at Indiana University, Bloomington, IN, were used to construct the statements on the "Intention to Use Condom Questionnaire." Data, with alpha level of .05, were analyzed by SPSS, 6.0. The variables were examined using Pearson moment correlation, ANOVA, multiple regression, and when applicable, Bonferroni post hoc comparison. The analysis revealed that there were gender differences among the variables toward intention to use condoms, that age and religious activities were positively correlated to behavioral intention, and perceived behavioral control was the strongest predictor to use condoms for both genders. AA college students with the most positive attitude, with most favorable subjective norm, and with the strongest perceived behavioral control toward condom use were more likely to use condoms to prevent HIV/STD.

Behavioral Intention and Use of Condoms for HIV/AIDS Prevention Among Rural African-American Students

The rate of human immunodeficiency virus (HIV) and sexually transmitted diseases (STDs) among college students is increasing. In addition, HIV is becoming a growing problem in rural communities, especially in the southern part of the United States. The prevalence of HIV infection has increased rapidly in the southern part of the United States from 25.7% to 34.9% for the periods 1981-1987 and 1993-1995 (Centers for Disease Control and Prevention [CDC], 1995a). Data from the CDC indicated that in the south and midwest 24% of all rural cases will occur in young people 13 to 19 years of age (CDC, 1995b). Rural residents and health care professionals cannot ignore the threat of acquired immunodeficiency syndroms (AIDS) (Cleveland & Devenport, 1989; Wismer, 1992).

Since the first cases of HIV were reported in 1981, the representation of African-Americans among people infected with HIV exceed their proportion in the general population by a factor of 2.3 (Catania, Kegeles, & Coates, 1990; Johnson, 1993). African-Americans constitute about 12% of the population, yet represent 27% of AIDS cases, and among AIDS cases in women, 53% are Black (CDC, 1989; Thomas, Gilliam, & Iwrey, 1989). In 1992, HIV infection and AIDS was the sixth leading cause of death among African-Americans (CDC, 1993c). Studies also have revealed that African-Americans in general are disproportionately affected with HIV/STDs in rural southern communities. Furthermore, studies indicate that African-American females are infected with HIV more than African-American males (Forney & Hollaway, 1990).

Age of sexual debut is an important risk factor for STDs, especially for women (Jemmott & Jemmott, 1991). In 1988, 81% of African-American men 15-19 years of age had sexual intercourse with at least one girl (Jemmott, Catan, Nyamathi, & Anastasia, 1995). Unfortunately, much of the sexual activities of African-American young adults occur without the protection of condoms, and whenever used the condom is not used consistently (Jemmott & Jemmott, 1991; Pleck, 1989). According to the CDC (1992; 1993a), a women can get HIV from vaginal intercourse only if her partner is infected. If a woman has intercourse without the use of a condom, she places herself at risk for exposure to HIV/STDs.

Two thirds of the people who contract STDs are under the age of 25. Out of these, one quarter are teenagers. Many of the affected young people suffer long term health problems as a consequence of their infection (Butcher, Manning, & O'Neal, 1991; Donovan, 1993). In addition, 2 in every 1000 American college students are infected with HIV (Carroll, 1991). The AIDS epidemic is cause for concern, especially when studies indicate that some three quarter of the American college student population frequently engage in risky behavior for contracting HIV/STDs (Carroll, 1991; CDC, 1991; DiClemente, 1992; Johnson, Gilbert, & Lollis, 1994).

Studies report that every 13 seconds an adolescent in the United States acquires a STD, with rural and urban low income female adolescents being particularly affected (Fisher, 1990; Yarber, 1993). In addition, about 5% of college students visit the health center because of an STD (O'Leary, Goodhart, Jemmott, & Boccher-Lattimore, 1992). Costs associated with just treating three STDs, chlamydia, gonorrhea, and genital herpes, are estimated to be over $5 billion annually (Alan Guttmacher Institute, 1993; Donovan, 1993).

These estimates, coupled with a study conducted by the CDC, revealed that college students are at significant risk for HIV infection (Gayle, Keeling, Garcia-Tunon, 1990).

Young African-Americans account for a significant and rapidly growing segment of the American population. Studies of Black youth, whose development experience is unique, constitute only minor components of the social science literature on young adults (McKenry, Everett, Ramseur, & Carter, 1989). Unfortunately, typical research designs in this area have made comparisons between lower income African-American students and more economically advantaged American White students, with the assumption of homogeneity between groups. By failing to address the differences between socioeconomic status and culture between Black and White students, health educators and social workers run the risk of designing ineffective programs aimed at addressing the prevalence of HIV/STDs within Black students.

It is apparent that with the disproportionate impact of AIDS in the Black community, special emphasis must be placed on reaching minority population with effective HIV risk reduction and AIDS prevention programs (Johnson, 1993). In order to develop and implement an effective program for the target population, it is crucial to have an understanding of African-Americans' attitude, subjective norms, and perceived behavioral control towards HIV risk reduction activities, like using condoms effectively whenever they engage in sex with their partners. In addition, the program should be evaluated continuously to determine its effectiveness.

The most effective way to prevent sexual transmission of HIV infection and other STDs is to avoid sexual intercourse with an infected partner. According to the CDC (1993a) and Shaw and Rienzo (1995), the proper and consistent use of latex condoms when engaging in sexual intercourse (vaginal, anal, or oral), can greatly reduce a person's risk of acquiring or transmitting STDs, including HIV infection. For a condom to provide protection it must be used consistently and correctly (CDC, 1993a) by preventing the individual from contacting semen, preejaculation fluids, vaginal and cervical secretions, genital, oral, or anal lesions (CDC, 1988).

Several studies have indicated that condoms are not consistently used among individuals within the African-American community who are at risk for HIV/STDs (Johnson, 1993). Most investigations relative to attitude on the use of condoms have been to compare African-Americans and other ethnic groups with their White counterparts (Johnson, 1993).

The need to develop and promote effective educational programs to prevent HIV/STDs among African-American students is now widely recognized. Research conducted by the CDC reveal that college students are at significant risk for HIV infection (Johnson, 1993; O'Leary, et al., 1992). Unfortunately, African-American college students, like others, frequently believe that HIV infection is not an issue of personal concern. Often they believe that years spent at college are for many a period of sexual exploration, an interval of risk to students who are misinformed or who fail to take the necessary precautions to prevent exposure to HIV (Butcher, et al., 1991). A most startling observation is that the percentage of African-American males, in a sample of college students in the South, who tested positive for HIV/AIDS was 6.5%, which was disproportionately higher than other ethnic groups (CDC, 1993b).

African-Americans who used condoms consistently had strong social support, and they also had positive expectations about condom use (Johnson, 1993). In addition, while African-American college students rely on social support from their parents or authorities in influencing their behavior, they also rely strongly on the support from their peers (Jemmott & Jemmott, 1991; Manning, Balson, Barenberg, & Moore, 1989).

African-American college students' condom use is related to perceived sexual enjoyment. If sexual enjoyment was perceived in the past while using a condom, the individual was more likely to use condoms in the future (Catania, Coates, & Kegeles, 1994; Catania, Coates, Golden, et al., 1994; Johnson, 1993; Kelly, 1996). According to Wulfert and Wan (1993), condom use in heterosexual relations depends to a significant degree on three factors, (a) the expected consequences of condom use, (b) perceived social support for condom use, and (c) perceived behavioral control or self-efficacy. This study will utilize the components of the theory of planned behavior to determine the behavioral intention of African-American undergraduate students to use or not to use condoms.

The Theory of Planned Behavior

The theory of planned behavior (TPB) is an extended form of the theory of reasoned action. The concept of perceived behavioral control was added in order to increase the theory's predictive value for behaviors that are not purely under one's control (Ajzen, 1985; Madden, Ellen, Ajzen, 1992). For example, intention to use condoms depends upon the cooperation of other people, or is based upon possession of adequate resources or opportunities. Because of the involvement of these other factors, condom use is not completely under an individual's volitional control (Ajzen, 1985; Ajzen & Madden, 1986).

The theory of planned behavior has three main conceptual independent variables of intention. The first is the attitude toward the behavior, and refers to the degree to which the person has favorable or unfavorable evaluation of the outcome of the behavior in question. The second concept is a social factor termed subjective norm. This refers to the perceived social pressure to perform or not to perform the behavior (Ajzen, 1988). The third determinant is the degree of perceived behavioral control. This concept refers to the individual's perceived ease or difficulty in performing the behavior in question.

With reference to young African-American undergraduate students, the transmission of HIV/STDs from one person to another person involves understanding the psychosocial dynamics within the young African-Americans' society. Understanding the various psychosocial factors and the role they play in decision making within this group is a vital component in predicting behavioral intention. The TPB implies that in order to change a behavior, it is necessary to modify the outcome, normative, and/or control beliefs that underlie that behavior (Ajzen, 1988). Hence, it would be necessary to establish that performing safe (condom use) sexual activities, or abstinence, by African-American college students will lead to valued outcomes. For the purpose of this study, intention to use condoms is the behavior of interest. For any given behavior, the behavior should be defined in terms of action, target, context, and time. The intention to use condoms is equal to action. Non-metropolitan African-American undergraduate college students in the south is equal to target. Intending to use condoms with their partners to prevent the spread of HIV/STD is equal to context. Intending to use condoms whenever they have sex is equal to time (Fishbein, Middlestadt, & Hitchcock, 1994). Once the behavior is clearly defined, it is then possible to find the determinants or barriers of intention to use condoms by African-American college students.

In order to be well informed about whether African-American undergraduate students intend to correctly and to consistently use condoms to prevent the spread of HIV/STDs, it is prudent, based upon the available literature, to determine the impact of their attitude, subjective norms, and perceived behavioral control toward their intention to use condoms. Studies indicate that there is substantial correlation between African-American college student's sexual behavior, including risky behavior for HIV/STDs, and religious participation (Kelly, 1995; Rubin, Billingsley, & Caldwell, 1994). Young African-Americans who attend church frequently and who value the role of religion in their lives hold less permissive attitudes toward life and are more likely to abstain from having sex (Davidson, Darling, & Norton, 1995). Whenever they do engage in sex, they are more likely to use condoms than African-American college students who rarely attend religious activities (Rubin, et al., 1994).

Method

The following specific research questions for this study were developed from the concepts defined in the theory of planned behavior.

1. Is there any relationship between attitude of African-American undergraduate students and their intention to use condoms?

2. Is there any relationship between subjective norms of African-American undergraduate students and intention to use condoms?

3. Is there any relationship between perceived behavioral control of African-American undergraduate students and their intention to use condoms?

4. Is there any relationship between intention to use condoms for the entire sample and the three components of the theory of planned behavior: attitude, subjective norms, and perceived behavioral control?

5. Is there any relationship between age, religiosity, and class level of African-American undergraduate students and their intention to use condoms.

Relationships among the theory variables were analyzed using the SPSS, version 6.0 statistical package. The following statistical procedures were used to analyze the data: Pearson correlation, multiple regression, and analysis of variance (ANOVA). If F-value was significant, then post hoc test, using modified Bonferroni comparison was done to indicate where significant differences existed. All analyses were done at an alpha level of significance of 0.05.

Selection of Subjects

A total of 524 students, 237 males (45%) and 287 females (55%), were deliberately selected from predominately Black colleges designated in the study as non-metropolitan regions in the South. This population was selected based upon the growing incidence of HIV/STD cases among the African-American population of this age group and in rural parts of the country. The subjects were exclusively African-American undergraduate students, between 18 and 22 years of age, attending colleges in non-metropolitan universities in the southern United States. Table 1 summarizes the number and percent of the sample for each of the following demographic variables: gender, age, number of years in college, and religiosity.

Intent to Use Condoms Inventory

The instrument for the study was developed from salient beliefs obtained from 10 open ended questions. These questions were administered to 100 African-American undergraduate students attending Indiana University. This group was representative of the target population.

Scales and Variables Used

The following variables (a) attitude toward behavior, (b) subjective norm, (c) perceived behavioral control, and (d) behavioral intention were assessed on a five point rating scale (1 to 5) based upon the intention to perform risky behavior for HIV/STDs the next month. The variable "attitude toward performing or not performing a risky behavior for HIV/STDs during the next month" was rated using a five point bipolar objective pair. Subjective norm, "the likelihood that significant others would want the subject to perform or not to perform risky behavior for HIV/STDs during the next month" was scored on a scale consisting of strongly agree, agree, not sure, disagree, to strongly disagree. Perceived behavioral control, confidence in one's ability to perform or

Table 1

Sample Characteristics (n = 524)

Gender	N	%
Male	237	45%
Female	287	55%

Age	N	%
Below 18	0	0
18	59	11%
19	121	23%
20	140	27%
21	111	21%
22	95	18%

Attend Religious Services	N	%
Never	14	8%
Less than once a month	115	22%
About once a month	181	35%
More than once a month	134	26%
More than once a week	53	10%

Educational Level	N	%
Freshman	169	32%
Sophomore	131	25%
Junior	121	23%
Senior	105	20%

not to perform the risky behavior for HIV/STDs was rated on a scale of 1 to 5. Behavioral intention was scored on a scale of strongly agree, agree, not sure, disagree, to strongly disagree.

Reliability Analysis for the Instrument

The data were analyzed using conventional item and test analysis techniques. These included computation of means, variances, inter-item correlations, item-total correlations, and Cronbach alpha reliability coefficient for each subscale. The Cronbach alpha reliability coefficient for the instrument was .90 alpha. (See Table 2.) It was concluded that the instrument had acceptable levels of reliability.

Results

In dealing with a socially sensitive issue like human sexuality, women and men have different experiences. Examination of group differences in the relative weighing of attitude, subjective norm, and perceived behavioral control will enhance understanding of condom use behavior.

Examination of group differences is also important with respect to intervention development. A Pearson's correlation between attitude for the entire sample and behavioral intention indicated a significant correlation of $r = .49$ ($p < .01$). These results can be found in Table 3. In an attempt to further investigate where possible differences might exist between the genders, the data were analyzed separately by gender.

Table 2

Cronbach Alpha Reliability Coefficient Analysis of the Instrument (n = 524)

Variable	Number of Items	Mean	Standard Deviation	Alpha
ATB	14	53.16	8.05	.73
SN	12	46.74	7.32	.79
PBC	13	53.01	7.26	.76
BI	7	28.90	5.01	.79
INDIRSN*	20	21.41	4.00	.76
INDIRATB**	12	10.94	1.95	.71
Reliability of Complete Instrument	62	245.84	24.67	.90

* INDIRSN - Indirect Subjective Norm
(normative behavior x motivation to comply + subjective norm = INDIRSN)
** INDIRATB - Indirect Attitude
(behavioral beliefs x outcome evaluation + attitude = INDIRATB)

Table 3

Pearson Correlations among Subscales on the Questionnaire for Total Sample (n = 524), Females (n = 287), and Males (n = 237)

Total (n = 524)

	BI	ATB	INDIRATB	SN	INDIRSN	PBC
BI		.49*	.36*	.62*	.21*	.73*
ATB			.23*	.56*	-.06	.54*
INDIRATB				.37*	.04	.31*
SN					.37*	.69*
INDIRSN						.17*
PBC						

Females (n = 287)

	BI	ATB	INDIRATB	SN	INDIRSN	PBC
BI		.53*	.39*	.63*	.20*	.75*
ATB			.21*	.57*	-.07	.59*
INDIRATB				.40*	.01	.33*
SN					.20*	.69*
INDIRSN						.10*
PBC						

Table 3 Continued

Males (n = 237)	BI	ATB	INDIRATB	SN	INDIRSN	PBC
BI	.44*	.33*	.61*	.22*	.71*	
ATB		.23*	.53*	-.06	.49*	
INDIRATB			.32*	.08	.30*	
SN				.29*	.69*	
INDIRSN					.25*	
PBC						

*p < .01

Table 4

Descriptive Statistics for the Theory Variables: Means and Standard Deviation of the Determinant Variables for Total Sample, Females, and Males

Variable	Number of Items	Range	Mean	Standard Deviation
Total (n = 524)				
ATB	14	15 - 55	40.60	7.17
SN	12	29 - 70	54.71	8.27
PBC	13	28 - 65	53.00	7.29
BI	7	11 - 35	28.91	4.97
Females (n = 287)				
ATB	14	23 - 55	41.39	7.16
SN	12	29 - 70	55.53	8.34
PBC	13	30 - 65	53.28	7.00
BI	7	11 - 35	29.08	5.07
Males (n = 237)				
ATB	14	15 - 51	39.65	7.10
SN	12	34 - 70	53.75	8.24
PBC	13	28 - 65	52.60	7.63
BI	7	15 - 35	28.77	4.86

Table 5

Gender Differences in Attitude Toward Intention to Use Condoms, in Subjective Norms Toward Intention to Use Condoms, and in Perceived Behavioral Control Towards Intention to Use Condoms

Variable	Male (n = 237)	Female (n = 287)	F Value Probability	Post Hoc
ATB				
Mean	39.65	41.39	F = 7.35*	Significant Female > Male
Standard Deviation	7.10	7.16		

Table 5 Continued

Variable	Male (n = 237)	Female (n = 287)	F Value Probability	Post Hoc
SN				
Mean	53.75	55.53	F = 5.69*	Significant Female > Male
Standard Deviation	8.24	8.34		
PBC				
Mean	53.60	53.28	F = 0.77	Not Signif.
Standard Deviation	7.63	7.00		

*p < .01

See Table 4 for a summary of descriptive statistics and test of significance between gender and the component attitude toward behavior. There was a significant difference between female and male students ($F = 7.35$; $p < 0.01$). African-American female college students had a more positive attitude toward condom use than did African-American male college students. The following results were obtained when Pearson's correlation coefficients were calculated. African-American female college students attitude toward behavior (ATB) was $r = .53$ ($p < .01$), and for African-American male college students it was $r = .44$ ($p < .01$) (See Table 3).

A Pearson's correlation between subjective norms for the entire sample and behavioral intention showed a correlation of $r = .62$, ($p < .01$). These results can be found in Table 3. See Table 4 for a summary of descriptive statistics and test of significance between genders and the component subjective norm. There was a significant difference between male and female students ($F = 5.69$; $p < 0.05$). African-American female students were more positively effected by subjective norms than were African-American male students. Further analyses indicated that both females' of $r = .63$ ($p < .01$) and males' of $r = .61$ ($p < .01$) intention to use condoms were significantly effected by subjective norm (see Table 3).

A Pearson's moment correlation between perceived behavioral control for the entire sample and behavioral intention showed a correlation coefficient of $r = .73$ ($p < .01$) (see Table 3). In an attempt to further investigate where possible differences might exist between the genders, the data was analyzed separately by gender. See Table 5 for a summary of descriptive statistics and test of significance between gender and the component perceived behavioral control. There was no significant difference between male and female students ($F = 0.77$; $P = 0.38$). African-American female ($x = 53.28$) and male ($x = 53.60$) college students were slightly similar in their perceived behavioral control toward condom use. Correlation coefficients were calculated for males ($r = .71$; $p < .01$) and females ($r = .75$; $p < .01$). There was a significant relationship between perceived behavioral control and intention to use condoms for both

female and male African-American undergraduate college students (see Table 3).

A multiple regression analysis was used to determine if a significant relationship existed. Attitude, subjective norm, and perceived behavioral control were significant at .05 alpha level (see Table 6). Perceived Behavioral Control explains more of the variance of the dependent variable, behavioral intention. The three main components are all significant in explaining the variance of the dependent variable (BI), with perceived behavioral control explaining more of the variance than subjective norm and attitude toward behavior, with attitude toward behavior being the least predictor of the variance. The three variables of the theory of planned behavior explain 57.3% of the total variance of behavioral intention (see Table 6).

Perceived behavioral control explains more of the variance of the dependent variable, behavioral intention. In addition, the three components of the theory explain 60.4% of the variance for females (see Table 6).

Perceived behavioral control explains more of the variance of the dependent variable, behavioral intention. The three components of the theory contribute to an explanation for 54% of the variance of behavioral intention for males (see Table 6).

Relationship of Demographic Variables to Intention to Use Condoms

Ajzen and Fishbein (1980) indicated that demographic variables will influence behavioral intention indirectly, only if the variables influence the components of the theory of planned behavior of attitude toward behavior, subjective norm, and perceived behavioral control respectively. The demographic variables for this study were age, class level, and religiosity of the African-American undergraduate college students.

Table 6

Multiple Regression Comparison of Dependent Variable of Behavioral Intention and Perceived Behavioral Control, Subjective Norm, and Attitude Toward Behavior for African-Americans: Total Sample, Females, and Males

Variable	Multiple Reg. R	R^2	Adjusted R^2	Standard Error	F
Total Pop. (n = 524)					
PBC	.729	.531	.530	3.405	592.547*
SN	.748	.560	.558	3.301	332.190*
ATB	.756	.573	.570	3.260	232.117*
Females (n = 287)					
PBC	.746	.557	.555	3.378	358.336*
SN	.770	.593	.591	3.241	207.384*
ATB	.777	.604	.600	3.204	144.078*
Males (n = 237)					
PBC	.711	.506	.503	3.426	240.255*
SN	.726	.527	.523	3.357	130.497*
ATB	.735	.540	.534	3.320	91.015*

*p < .01

An ANOVA was conducted and the difference between BI and age was significant (F = 6.33, p < .01). Bonferroni test (post hoc) was conducted to see where the differences between the age groups exist. Twenty one to twenty two year olds had a significantly greater mean (x = 29.82) than did the 19 - 20 year olds (x = 28.17). It is possible to suggest that age had a positive influence on behavioral intention.

There was a significant difference between age and attitude toward using condoms (F = 11.79, p < .01). Twenty one to twenty two year olds had a significantly greater mean (x = 46.89) than did the 18 year olds (x = 44.32), and the 21 - 22 year olds had a significantly greater mean than did the 19 - 20 year olds (x = 43.56). There was a significant difference between age and subjective norm (F = 4.47, p < 0.05). Twenty one to twenty two year olds had a significantly greater mean (x = 77.57) than did the 19 - 20 year olds (x = 74.78). There was a significant difference between age and perceived behavioral control (F = 6.39, p < .01). Twenty one to twenty two year olds (x = 54.42) had a significantly greater mean than did the 18 year olds (x = 52.90), and the 21 - 22 year olds had a significantly greater mean than did the 19 - 20 year olds (x = 52.13).

An ANOVA was conducted and the difference between BI and religiosity was significant (F = 6.95, p < .01). The group who attended religious services about once a week or more, had a significantly greater mean (x = 30.08) than did the group who attended religious services less than once a month (x = 28.37). The frequency of religious activity attendance positively influenced behavioral intention. Further analyses by gender indicated that only female students had a significant impact of religious activity to behavioral intention (F = 6.10, p < .01). Females who attended religious services once a week or more had a significantly greater mean (x = 30.43) than did females who attended church about once a month (x = 28.27).

Subanalysis were conducted to determine if there were significant differences between religious attendance and attitude, between attendance and subjective norm, and between attendance and perceived behavioral control. There was significant difference between religiosity and attitude (F = 4.67, p < .01). The group who attended religious services one a week or more (x = 46.37) had a significantly greater mean than did the group who attended about once a month (x = 44.21). There were significant differences found religiosity and attitude for African-American females between groups. The group who attended about once a week had a significantly greater mean (x = 47.19) than did the group who attended about once a month (x = 44.92).

Analysis was conducted between religiosity and subjective norm ($F = 2.41$, $p = .09$). There was no significant difference found between subjective norm and religiosity. Subanalysis for the entire sample was conducted between religious attendance and perceived behavioral control ($F = 2.85$, $p = .06$). There was no significant difference between religious attendance and perceived behavioral control.

When religiosity and perceived behavioral control was analyzed by gender, there were significant differences within African-American female student groups. Females who attend religious activity about once a week had a significantly greater mean ($x = 54.76$) than did those who attend about once a month ($x = 52.53$). An Anova was conducted and the differences between PBC and religiosity was significant ($F = 3.71$, $p < .05$). African-American female college students' attendance at religious activities influence their perceived behavioral control to use or not to use condoms.

Discussion of the Findings

From the study, it was discovered that the three variables have a positive and significant impact in predicting intention to use condoms, by both African-American females and African-American males. Results from the study suggested that African-American female and African-American male undergraduate college students differed slightly on the model constructs, in terms of group mean differences. African-American females reported slightly more positive attitudes, subjective norm, and perceived behavioral control toward condom use than African-American male undergraduate students.

Of greater interest are the gender differences in the prediction of behavioral intention and condom use. The path from attitude toward condom use in predicting behavioral intention to use condoms differed significantly by gender. The results (see Tables 15 and 17) suggested that attitudes toward condom use predicted behavioral intention for African-American female college students, but not for African-American male college students. Subjective norms predicted behavioral intentions for both African-American female and male college students. Perceived behavioral control appeared to be an important factor in predicting behavioral intention to use condoms for both male and female students.

Consistent with virtually all studies over time, class level or knowledge about AIDS, using the components of the theory of planned behavior, was not effective in predicting intention to use condoms for both African-American female and male students. Similarly, the findings of the study support the findings by DeBlassie (1993), Jemmott and Jemmott (1991), and Jemmott and others (1995) that young African-American college students are more likely than older African-American college students to engage in risky sexual behaviors that are likely to expose them to HIV/STDs. In conjunction with other studies (Davidson, et al., 1995; Kelly, 1995; Rubin, et al., 1994), the higher the frequency of attendance to religious activities the more likely African-American college students are to abstain from sexual activities or intend to use condoms to prevent the spread of HIV/STD.

Conclusions

Based on the findings and within the limitations of this investigation, the following conclusions were made:

1. For both genders, African-American undergraduate college students with positive attitude toward condom use, with most favorable subjective norm to use condoms, and with the strongest perceived behavioral control were more likely to intend to use condoms to prevent HIV/STD.
2. African-American female and male undergraduate college students' intentions to use condoms to prevent HIV/STD infection is predicted by the theory of planned behavior.

Implementations

On the basis of the findings of this study, the following suggestions for implementation are warranted.

1. Since there were moderate gender differences in the results obtained from the analyses, comprehensive educational and intervention materials should be developed incorporating some of these differences between the genders.
2. The subjective norm, which is influenced by normative beliefs and motivation to comply, was significantly related to behavioral intention to use condoms. This may suggest that sexual partners, parents, family members, authority figures, and religious leaders can influence whether or not an individual uses a condom. One vital suggestion concerning the influence of others on behavior is to open the lines of communication about condom use. In addition, subjective norms were related to behavioral intention for both African-American female and male college students, thus components such as described above regarding normative beliefs should be included for both groups.
3. Of particular importance for intervention development is to incorporate those salient beliefs that influence subjects' intentions to use condoms for the prevention of HIV/STD. Examples of these salient beliefs are (a) an individual's opinion about condom use, (b) the opinion(s) of significant others about condom use, and (c) the individuals ability to use condoms.

Finally, sex is by definition a social behavior. Condom use, perhaps to a lesser degree, could also be considered a social behavior incorporating the attitudes, subjective norms, and perceived behavioral control of two people. Any instance of condom use or nonuse will be the result of the interactions between attitudes, subjective norms, perceived behavioral control, and behavioral intention of two people. It is therefore vital that a thorough understanding of condom use behavior, and its determinants, requires understanding partners' perceptions and beliefs.

Recommendations

Recommendations for further research pertaining to the intention to use condoms by African-American young adults to prevent the spread of HIV/STDs are as follows:

1. This study should be replicated with a sample of African-American undergraduate college students in predominantly African-American colleges in metropolitan areas in the southern United States.
2. This study should be replicated with a sample of African-American undergraduate college students in predominantly African-American colleges in other regions of the United States, both metropolitan and non-metropolitan.
3. Future research in the area of HIV risk reduction behavior should be conducted within the framework of sound social psychological theory, like Ajzen's (1985) theory of planned behavior. Subject areas for future research could include abstinence, fidelity, mutual monogamy, and HIV testing.
3. Future research is needed for intervention development programs aimed at those specific barriers that were significantly related to behavioral intention to use or not to use condoms.
4. Further research should be done to determine why African-American male students reported lower in the three determinant variables of the theory than African-American female students.
5. Even though there were gender differences, additional research is needed to determine why these gender differences exist.
6. Research using the theory of planned behavior should be done using African-American adolescents as the target population.
7. Future research should be done on the impact of perceived behavioral control on influencing the actual use of condoms in preventing HIV/STD infection.
8. Health educators should be aware of and sensitive to the belief systems of their targeted population when designing educational materials, by incorporating some of these beliefs, when appropriate, in the intervention program.
9. It is crucial that educational materials designed for this population should not only inform, but also motivate behavior change to encourage condom use. Therefore, health educators should use varied methods in presenting the information such as technology, television, videos, sport stars, local celebrities, and religious leaders. Education material should also be incorporated into their cultural music, such as "hip-hop" and "rap." In addition, other factors that motivate young adults/adolescents to adapt and maintain s fe behavior, such as condom use, require clarification to develop effective HIV prevention programs.
10. The programs developed should be understood by the targeted population and acceptable to them. Individuals from the targeted population should be actively involved in designing and implementing the program. Furthermore, condoms should be available, affordable, accessible, acceptable, and pleasurable to use. To ensure its continued effectiveness, any program should be frequently evaluated and revised when necessary to continue achieving its stated goals. Health professionals should translate health knowledge into effective self protection action against HIV infection. This requires social and self regulative skills and a sense of personal power, especially for African-American female students, in exercising control over sexual situations.
11. Future research is needed to determine the impact of intervention programs developed from this study.

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BREAKING CONFIDENCE ABOUT RISKY SEXUAL BEHAVIOR: RURAL AREAS, RACE, GENDER, SEXUAL ORIENTATION, AND OTHER FACTORS

Shobha Pais and Fred Piercy

Will marriage and family therapists break confidence when they learn that an HIV client is having anonymous unprotected sex and will the frequency of reporting vary depending on the characteristic of the client and the therapist? Responses to these questions are summarized below.

The practice of marriage and family therapy is bound by the professional responsibility of client-therapist confidentiality. However, there are limits to confidentiality. The code of ethics of the American Association for Marriage and Family Therapy (AAMFT) published in 1991 directs professionals to protect the confidentiality of the clients as well as to protect third parties from clear and immediate danger. However, the code offers no operational definition of what constitutes danger. These limits are not clear for clients who have the AIDS virus and who continue to be sexually active without informing their partners of their conditions.

In the last few years literature on ethics related to AIDS has addressed balancing the rights of HIV positive individuals and the rights of society to protect itself against the spread of the disease. Many authors discuss the therapist's duty in terms of protecting third parties from harm (DelaRosa, 1987; Fulero, 1988; Wood, Marks, & Dilley, 1990). North and Rothenberg (1989) argue that the tensions among professionals and legal obligations can be reconciled. Girardi, Keese, Traver, and Cooksey (1988) describe the predicament of disclosure of AIDS to a known sexual partner as comparable to the predicament analyzed in the *Tarasoff v. Regents of the University of California* appelate court case of 1976. *Tarasoff* involved a client who threatened, during therapy, to kill his girlfriend and did so two months later. Participants at the professional dialogue on "Does *Tarasoff* Obligate" (1976) concluded that therapists have an obligation to warn any known sexual partner of the client who has tested positive for the HIV virus, regardless of the client's cooperation. Two factors that are important in applying *Tarasoff* to AIDS clients are whether (a) a genuine client–therapist relationship exists, and (b) whether communication exists of a serious and imminent threat of physical violence toward reasonably identifiable victim(s).

Conversely, those opposing the *Tarasoff* argument believe that protecting a partner(s) of an AIDS client is beyond the responsibility of the therapist since the issues raised in AIDS cases differ from those raised by dangerous mental health clients in several ways. First, depending on sexual practices, not all seropositive clients pose the same degree of risk to third parties. Second, disclosure to past sexual and needle–sharing partners would not necessarily prevent risk of infection. Thirdly, disclosure to a third party may result in severe discrimination and physical and emotional harm (Harding, Gray, & Neal, 1993). Also, unlike *Tarasoff*, the HIV positive client does not always know the identity of the intended victim since their sex partners may be anonymous.

The present study was designed to explore the relationship between client socio-demographics or background characteristics and a professional decision to breach confidentiality with marriage and family therapists. Specifically, we examined how client and family therapist characteristics are related empirically to the likelihood of disclosure and perceptions of danger when HIV positive clients engage in unprotected sex.

The Survey

A modified factorial survey design was used for this study. A two-part research instrument was developed, containing a conventional demographic and background survey and a set of "vignettes" with systemically varied characteristics of HIV–positive clients. A pretest was conducted to assess the readability of the vignettes. The research instruments (questionnaire and a set of vignettes) were mailed to a random sample of AAMFT clinical members in the United States. A mailing list from AAMFT (dated December-January 1995) provided the names and the addresses of the clinical members arranged by postal code. The sample was chosen from this list using a table of random numbers.

Dillman's (1978) model of questionnaire construction was followed to create instruments for the study. The survey research instrument consisted of two parts: the demographics and the vignettes. Demographic items measured the therapist's background characteristics and work experiences including gender, race, age, and highest degree attained, age at which training in marriage and family therapy was completed, whether the therapist is licensed or certified to practice in their state, the number of years conducting therapy, the type of geographical setting (rural vs. urban) in which the therapist works, and whether the therapist works with HIV/AIDS clients. Based on an extensive literature review on ethical dilemmas in AIDS prevention and treatment from the early 1980s to the present, we prepared the following single vignette that included an ethical dilemma related to the family therapist's work with HIV positive clients:

> At a counseling session Jack, a 17 year old gay white male, tells you he is having anonymous unprotected sex. He also tells you that he has been tested for the HIV/AIDS virus and is HIV positive.

The client's gender (male, female), age (17 and 31), race (Caucasian, African American, and Hispanic), sexual orientation (heterosexual, homosexual), and HIV status (HIV positive, HIV negative, HIV status unknown) are the factors described in the above vignette. We systematically rotated these factors and created a total of 72 vignettes (2 X 2 X 3 X 2 X 3 = 72).

Each vignette ends with two 100 point rating scales. The first measures perceived dangerousness of the respondent's behavior and asks, "What danger to others does this client pose?" while the second measures the therapist's perceived likelihood of maintaining confidence and asks: "What is the likelihood that you would break client confidence?"

To maximize the information gained from this study, without generating a large number of missing cases due to the length of the research task, four groups of 18 vignettes were randomly selected from the initial pool of 72 to create four versions of the research instrument — a packet of vignettes and a traditional survey research instrument.

We conducted a pilot test to initially assess the research instruments with the assistance of 3 faculty and 2 senior level Ph.D. students enrolled in Purdue University's Marriage and Family Therapy Program. All five provided detailed feedback on the length, clarity, and the format of the questions.

Dillman's (1978) "total design method" was modified and used to optimize the return rate for this mail out–mail back survey. The survey packets were mailed first class to a random sample of AAMFT clinical members. Each packet included instructions, the research instruments, and a stamped return envelope. A statement of confidentiality was also included. One week after the initial mailing a reminder postcard was sent to all sampled persons and three weeks after the initial mailing, a replacement survey packet was mailed to all non–respondents.

After two months, a separate mailing was sent to 60 of the respondents who indicated their willingness to retake the survey for the purposes of establishing the reliability of the study's two dependent variables. A new cover letter and all of the materials were included in the first and second mailings .

A total of 309 completed sets of research instruments were returned. The total response rate was 44.14% (n=309). All of the 60 respondents who participated in the reliability study completed and returned the surveys.

The Respondents' Characteristics. The demographic profile of the therapists (respondents) is outlined in Table 1.

Methods of Data Analysis. A Pearson product moment correlation was used to compute the test–retest reliability for the two dependent variables, i.e., the ratings of perceptions of danger and likelihood of disclosure. The reliability data for the four vignette packet types ranged from 0.383 to 0.982 with a mean test–retest reliability of 0.694.

Table 1

Demographic Profile of Therapists

Mean age of therapists	54.3 years
Mean years of clinical experience	17.9 years
Gender: *Females*	163 (52.8%)
Males	145 (46.9%)
Education: *Ph.D.*	131 (42.1%)
Masters	145 (46.9%)
Race: *Caucasians*	291 (94.2%)
Religion: *Protestant*	150 (48.5%)
Catholic	55 (17.8%)
Religiosity: *Very religious*	117 (37.9%)
Somewhat religious	145 (46.9%)
Location of Practice: *Rural*	64 (20.7%)
Urban	251 (78.0%)
Experience with AIDS clients	191 (61.8%)
Experience with Gay/Lesbian clients	284 (91.9%)

Data were analyzed using multiple regression. When significant main effects were found from ANOVA, we conducted *post hoc* analyses (Tukey) to identify where significant differences existed. When we found significant interactions, we conducted tests of simple effects to determine the sources of variance.

We examined two central research questions: how therapists' perceptions of danger and their likelihood of disclosure vary as a function of client age, gender, race, sexual orientation and HIV status; and how therapists' perceptions of danger and their likelihood of disclosure vary as a function of therapist characteristics, including age, gender, religion, religiosity, and geographic location of their practice.

Results

To Whom Would Therapists Break Confidence?

Table 2 shows a frequency distribution that describes the categories of people to whom our family therapist sample would break confidentiality.

Therapist Responses And Client Characteristics

Two statistical techniques were used to address the question, "how does the therapist's perceived danger of sexual behavior and the likelihood of disclosure vary according to the age, gender, race, sexual orientation, and HIV status of the client?" First, we compared the mean scores of the two dependent variables across categories of clients and therapist responses, using t–tests to assess statistical significance. Second, we estimated ordinary least squares (OLS) models to identify the net effects of client characteristics on thera-

pists' perceptions of danger and their likelihood of breaking confidentiality.

Table 2

To Whom Therapists Would Break Confidence

	n	% of Total N=309
Sexual Partners	183	59.2
Therapist's Clinical Supervisor	155	50.2
Lawyer	112	36.2
Immediate Family Members	94	30.4
Police	22	7.1
Children	10	3.2
Minister/Priest	10	3.2
Client's Work Supervisors	7	2.3
Friends	4	1.3
Extended Family	3	1.0

Perception of Danger as a Function of Client Characteristics.

To examine the influence of each client characteristics separately, we compared mean values in therapists' perceptions across categories. In examining t-tests for determining whether or not differences in mean scores were statistically significant we found no differences for client age. That is, respondents did not perceive younger clients (17 years old) to be more or less dangerous than older clients (31 years old) who engage in anonymous and unprotected sex.

However, there was a significant difference for gender of the client, ($F(1,307) = 33.82$, $p < .001$). Therapists perceived male clients who engaged in unprotected sex ($M = 72.84$) more dangerous to others than female clients ($M = 65.04$).

In terms of client race, we found a significant difference between Caucasian and African American clients, ($F(2,306) = 3.89$, $p < .005$). If the clients engaging in unprotected sex were African Americans ($M = 70.13$), the respondents perceived them to be more dangerous to others than Caucasian clients ($M = 67.96$). No significant difference was found in terms of the sexual orientation of the client. However, respondents were more likely to perceive HIV positive clients ($M = 90.66$) as more dangerous to others than HIV negative clients ($M = 53.55$) when both groups of clients engaged in unprotected sex ($F(2,306) = 1234.39$, $p < .001$).

Perception of Likelihood of Disclosure as a Function of Client Characteristics.

To examine each client characteristic separately, we compared means across client age, gender, race, sexual preference, and HIV status. No significant differences were found for age. Therapists perceived that they were no more or less likely to disclose when the client is younger or older.

There was, however, a significant gender effect ($F(1,307) = 74.16$, $p < .001$). That is, if clients who engage in unprotected sex are men ($M = 26.97$), therapists are more likely to disclose than if their clients are women ($M = 22.31$). We also found a significant race difference when examining mean values for Caucasians and African American clients, and Hispanic and African American clients, with $F(2,306) = 11.05$, $p < .005$ and $F(2,306) = 5.93$, $p < .05$ respectively. The likelihood of disclosure was higher for African American clients than for Caucasian and Hispanic clients.

The client's sexual orientation $F(1,307) = 3.63$, $p < .05$ influenced perceived likelihood to disclose. Therapists were more likely to disclose if the client was homosexual, ($M = 25.35$). Also, we found significant differences for clients who were HIV positive and negative $F(2,306) = 1158.37$, $p < .001$, as well as positive and unknown $F(2,306) = 764.14$, $p < .001$. That is, the likelihood of disclosure by therapists was higher for HIV positive clients ($M = 44.29$) compared to HIV negative clients ($M = 13.30$) or HIV unknown clients ($M = 16.53$).

We also conducted a multiple regression (OLS) model to examine variance in therapists' perception of danger and perceptions of likelihood of disclosure, as a function of each of the client characteristics, net of the remaining client characteristics rotated in the vignettes. The dependent variables, perceptions of danger and the perceptions of the likelihood of breaking confidence, were coded on a 100 point interval level scale. We created blocks of dummy variables to estimate simultaneously the net effects of client age, client gender, client race, client sexual orientation, and client HIV status. For each nominal level independent variable, one category was omitted in the OLS analysis. The model was used to analyze 5,429 judgments given by the therapists who participated in this study.

The dependent variable, perceptions of danger, on average was 68.92 points. The R^2 for this equation, .30, indicated that the client characteristics measured in this study accounted for 30% of the variance in therapists' ratings of perceived danger.

In terms of the client's age, being young (17 years old) increased the perception of danger by only 0.82 points, and the age coefficient was not statistically significant. Client gender, however, was significant, controlling for all other client characteristics. Compared to female clients, male clients elicited a higher perception of danger by 5.7 points on the 100 point rating scale. The net effect of race was found to be small and statistically insignificant. However, the therapists reported an increase in perceptions of danger for African American, and a decrease in danger for Hispanic clients, compared to Caucasian clients.

The sexual orientation of the client had no significant net effect on perceptions of danger. The partial regression coefficient for homosexual showed an increased in perceptions of danger of only 0.31 points.

Controlling for all other client characteristics in the model, this analysis indicated that the client's HIV status affects perceptions of danger. HIV positive clients elicit a 27.30 point increase in perceptions of danger compared to HIV unknown clients (the omitted category). For clients who are HIV negative, compared to HIV unknown clients, the perception of danger decreased by 9.45 points. HIV positive clients are perceived as most dangerous relative to either HIV negative or HIV unknown clients.

An analysis of the second dependent variable, the likelihood of disclosure, was also measured on a scale of 0 to 100. The model analyzed 5,325 judgments. On an average, the rating was 24.63 points. That is, on an average, the respondents rated likelihood of disclosure at 24%. The R^2 for this equation, 0.20, indicated that the dimensions involved accounted for 20% of the variance in the ratings.

In terms of client age, being young (17 years old) significantly increased likelihood of disclosure by 1.68 points. Client gender was also a significant factor, controlling for all other client characteristics. Compared to female clients, male clients elicited a higher likelihood of disclosure by 2.73 points on the 100 point rating scale. With respect to client race, likelihood of disclosure for African American clients increased by 1.06 points on the rating scale compared to Caucasian clients (the omitted category). Also, being Hispanic increased the likelihood of disclosure by 0.24 points compared to Caucasian clients. The race coefficients were not statistically significant.

The sexual orientation of the client also had no significant effect on the likelihood of disclosure. The partial regression coefficient for homosexual orientation shows an increase in likelihood of disclosure of only 0.83 points.

Controlling for all other clients characteristics in the model, this analysis showed that the client's HIV status substantially affected the therapists' perceived likelihood of disclosure. HIV positive clients elicited a 27.44 point increase in likelihood of disclosure compared to unknown clients (the omitted category). For clients who were HIV negative, compared to HIV unknown clients, the likelihood of disclosure decreased by 3.30 points. That is, the likelihood of disclosure is highest for HIV positive clients relative to either HIV negative or HIV unknown clients.

The two equations specified for analyzing perceptions of danger and perceptions of likelihood of disclosure yielded similar findings. Gender and HIV status influence perceptions of therapists. In addition, client age affected the likelihood of disclosure.

Therapist Responses and Therapist Characteristics

This study was also guided by the second major research question: "How does the perceived danger of sexual behavior and the therapists' perceived likelihood of disclosure vary as a function of therapist age, gender, religion, religiosity, and geographic location (rural v. urban)of practice?" The mean scores of the two dependent variables were compared across therapist characteristics using the analysis of variance (ANOVA)[1]. Ordinary least squares (OLS) models were estimated to identify the net effects of therapist characteristics on their perceptions of danger and the likelihood of breaking confidentiality.

Perception of Danger as a Function of Therapist Characteristics.

Results of the 2 (Male, Female) X 4 (35–47 years, 48–60 years, 61–73 years, 74–86 years) X 4 (Protestant, Catholic, Jewish, No religion) X 3 (Very religious, Somewhat religious, Not religious at all) X 2 (Urban practice, Rural practice) ANOVA for perceived danger of sexual behavior indicate that therapists differ in their perceptions of danger based on the following characteristics: gender, age, religion, religiosity, and geographic location of practice. *Post hoc* analysis (Tukey) revealed that there were significant differences between younger and older therapists. The older therapists, compared to the younger therapists, perceived clients engaging in anonymous unprotected sex as being more dangerous. Catholic therapists were more likely than others to perceive clients engaging in anonymous unprotected sex as being dangerous to others. Additionally, in terms of the therapist's religiosity, the 'very religious' and the 'somewhat religious' therapists were more likely to perceive clients engaging in anonymous unprotected sex as dangerous.

The geographic location of the therapist's practice was a significant factor. Therapists who report that they practice in an "open country" setting, in "a suburb near a large city," or in "a large city" were more likely than others to perceive clients engaging in anonymous unprotected sex as dangerous to others. Data were recorded to reflect "rural" v. "urban" categories for the population variable. The rural category included the open country and small city or town, while the urban category included the medium size city, a suburb near a large city, and a large city. Therapists practicing in urban areas tended to perceive clients engaging in anonymous unprotected sex as more dangerous ($M = 69.38$) than therapists practicing in rural areas ($M = 67.13$), ($F(1,307) = 5.12$, $p < .05$).

Perception of Likelihood of Disclosure as a Function of Therapist Characteristics.

Results of the 2 (Male, Female) X 4 (35–47 years, 48–60 years, 61–73 years, 74–86 years) X 4 (Protestant, Catholic, Jewish, No religion) X 3 (Very religious, Somewhat religious, Not religious at all) X 2 (Urban practice, Rural practice) ANOVA for the dependent variable that measures the likelihood of disclosure indicate that therapists differ by age, gender, religion, and religiosity. *Post hoc* analysis (Tukey) revealed that there were significant differences between therapists in the various age groups. The older therapists, compared to the younger therapists, were more likely to disclose when clients are engaged in anonymous and unprotected sex.

We also found Catholic therapists to be more likely than others to disclose when a client engaged in anonymous unprotected sex. Also, the 'very religious' therapists were more likely to disclose compared to therapists who reported being 'somewhat religious' or 'not religious at all.' The data on geographic location of practice were recoded to reflect rural versus urban differences. The rural category included the open country and small city or town while the urban category includes the medium size city, a suburb near a large city, and a large city. We found that therapists who practice in urban areas were more likely to disclose about clients engaging in anonymous unprotected sex (M= 24.68) than therapists practicing in rural areas
(M= 24.43 ($F(1,307) = .054$, $p < .05$).

A single equation model was specified to explain variance in both dependent variables as a function of therapist characteristics, i.e., therapist age, gender, race, whether or not the therapist has worked with HIV/AIDS clients, whether or not the therapist had worked with gay/lesbian clients, and the geographic location (rural v. urban) where the therapists practice. The very low R^2 values for both equations (0.008 and 0.014) indicated that therapist characteristics do not by themselves explain any substantial amount of variance either in their perceptions of danger or their perceptions of the likelihood of breaking confidentiality.

Perceptions of Danger and the Likelihood of Disclosure as a Function of Client and Therapist Variables: Multiple Regression Analysis

A final multiple regression model was specified to explain variance in both the dependent variables as a function of client and therapist characteristics simultaneously. The R^2 for the perception of danger equation indicated that 31% of the variance in the ratings can be explained.

Client age did not predict perceptions of danger but was a significant predictor of the likelihood of disclosure. Therapists perceived that they were more likely to break confidentiality if the client was younger. Client gender, controlling for all other factors explained variance in both dependent variables. Compared to female clients, male clients elicited a higher perception of danger (5.72 points) as well as a greater likelihood of disclosure (2.67 points).

Client race, on the other hand, did not significantly influence perceptions of danger or the likelihood of breaking confidentiality. However, there was a nonsignificant race trend in the analysis. African Americans tended to elicit an increase in perceptions of danger and disclosure, relative to other racial groups, controlling for all other client and therapist characteristics. The client's HIV status (positive or negative) was a significant predictor in both models, controlling for all other client and therapist (i.e., respondent) characteristics. Compared to clients with an unknown HIV status, HIV positive clients elicited a 27% increase in perceptions of danger and in the therapist's likelihood of disclosure. For clients who are HIV negative (compared to HIV unknown clients) the perception of danger decreased (by 9.40 points) and the likelihood of breaking confidentiality decreased (by 3.10 points). Therefore HIV positive clients were perceived to be the most dangerous clients. They were also the most likely, according to these therapists, to experience a breach in therapist–client confidentiality.

Therapist age was a significant factor for predicting their perceptions. Perceptions of danger increased by 0.17 points for each year of therapist age. Perceptions of likelihood of disclosure increased by 0.33 points for each year of therapist age.

Therapist gender was also a significant factor. Compared to male therapists, female therapists indicate a higher perception of danger (3.20 points) and a greater likelihood of disclosure (1.68 points).

Almost all respondents (94.2%) were Caucasian. Thus, the partial regression coefficients for race must be interpreted with caution. Race had no significant net effect on perceptions of danger. However, Caucasian therapists were more likely than African American or Hispanic therapists to perceive that they would break client confidentiality.

All respondents were asked if they have worked with HIV/AIDS clients, or had any experience with gay/lesbian clients. Experience with HIV/AIDS clients did not explain variance in either dependent variable. The therapist's experience with gay/lesbian clients, however, was a significant factor for predicting therapists' perceptions. Those who work with gay and lesbian clients showed a 4% decrease in their perceptions of danger and a 5% decrease in their perceived likelihood of disclosure.

It is apparent from this study that therapists' perceptions vary greatly, based in part on the client's gender, race, and HIV status; and, the therapists' age, gender, religion, religiosity, and geographic location of practice. The OLS models that explain variance in both dependent variables as a function of both client and therapist characteristics, suggest that a small number of client characteristics have a substantial effect on perceptions of dangerousness and the likelihood of disclosure. A larger number of therapist characteristics add only modestly to the amount of variance explained by these models.

Discussion

Tables 3 and 4 summarize the major findings of this study. It is clear that socio-demographic characteristics of both the client and the therapist affect therapist perception of danger and (reported) likelihood to disclose.

If a client who engages in unprotected sex is a Caucasian woman and HIV positive, she is perceived as less dangerous than a client who is an African American man who is HIV positive. Most HIV/AIDS education emphasizes that what puts a person at risk for HIV infection is not the individual's socio–demographic characteristics but the behaviors in which (s)he engages. It is unsettling to think that therapists tend to mitigate the danger of HIV transmission simply because a

Table 3

Summary of Results of Therapist Responses and Client Characteristics Explained in terms of Higher Perceptions of Danger and Likelihood of Disclosure

Client Characteristics	Greater Percetion Of Danger	Higher Likelihood Of Disclosure
Gender	Male*	Male*
HIV Status	Positive*	Positive*
Age	-	Young*
Race	African American	African American
Sexual Orientation	-	Homosexual

* Results from multiple regression analysis

Table 4

Summary of Results of Therapist Responses and Therapist Characteristics Explained in terms of Higher Perceptions of Danger and Likelihood of Disclosure

Therapist Characteristics	Greater Perception Of Danger	Higher Likelihood Of Disclosure
Gender	Female*	-
Age	Older*	Older*
Worked with Gay/ Lesbian Populations	Less Experience	Less Experience*
Race	-	Caucasian*
Religion	Catholic	Catholic
Religiosity	Very Religious	Very Religious
Geographic Location Of Practice	Urban	Urban

* Results from multiple regression analysis

[1] *ANOVA was used here instead of t-tests to examine the significance of mean differences. For many of the therapist characteristics, age or religiosity, for example, several levels of the independent variables would make t-test interpretations problematic. A more parsimonious approach is to use ANOVA to examine differences.*

client is from a particular demographic group.

Another important issue raised here is the potential for discrimination in breaking client confidence. Similar to perceptions of danger, the likelihood of disclosure is also higher for some groups than others. Some groups were viewed less vulnerable than others and therefore may have been taken less seriously than others. In terms of client characteristics, for example, therapists reported that they would be less likely to break client confidence for an older, Caucasian, heterosexual woman engaging in unprotected sex than for a young, African American, gay man. On the other hand, older, very religious, Catholic therapists, with little or no experience in working with gay/lesbian populations, and practicing in urban areas, were more likely to break client confidence compared to other therapists. We are concerned that a therapist's decision to break confidence appears to depend, in part, on the therapist's background characteristics. This raises the question of whether or not background, prejudices, political beliefs and agendas of therapists may play a critical role in their therapeutic decisions regarding HIV positive clients.

We make no ethical or legal claim regarding what a therapist should actually do when (s)he learns that a client is having anonymous and unprotected sex. There is a strong case both for and against disclosure. Conceivably, disclosure would save lives. On the other hand, there are published studies that suggest breaking a client's confidence is detrimental to the client continuing in therapy (Kobocow, McGuire, & Blau, 1983; Woods & McNamara, 1980; Corcoran, 1988). Unfortunately, the laws in most states are not clear or certain. It appears that when there are no clear guidelines, bias and prejudice may determine decision making. Therefore, until a professional consensus emerges, therapists should be informed by the ethical standards of their profession. Decisions about disclosure and breaking client confidentiality should therefore be based on state laws, professional consultations, professional ethics standards, and other issues beyond gender, age, race or sexual orientation of the client. Similarly, important clinical decisions regarding HIV positive clients should not be influenced by the demographic or background characteristics of the therapist. With the rapid increase of psychotherapy with HIV/AIDS clients, marriage and family therapy training will need to address the legal and ethical dilemmas that a therapist will encounter. With no clear guidelines and differences in state laws regarding the duty to warn, the impact of factors related to clients and therapists such as those examined in this study become important. Thus, therapists must recognize that prejudice and bias can guide decision making, particularly affecting duty to warn issues. Perhaps family therapy training programs should include discussions of bias and decision making exercises for HIV treatment as part of students' ethics curricula.

Clearly, this study draws attention to the need for more research and training in the area of duty to warn issues with HIV positive clients.

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Rural & Urban Communities' AIDS/STD Educational Needs Assessment

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Although AIDS-related deaths in the United States declined in 1996 (Brown, 1997), a total of 548,102 cases of Acquired Immunodeficieny Syndrome (AIDS) has been reported since 1981 and 338, 831 have died of this disease . Meanwhile, a total of 80,489 individuals living in the United States have been infected with the Human Immunodeficiency Virus (HIV) which lead to AIDS (National Center for HIV, STD, and TB Prevention, 1996). In Indiana, its cumulative AIDS cases reached 4,219 by the middle of 1996. In addition, a total of 2,705 Indiana residences have been infected by HIV (National Center for HIV, STD and TB Prevention, 1996). About 5.36% of all AIDS cases in the States have occurred in rural areas (Centers for Disease Control and Prevention, 1995), and the number of AIDS and HIV positive cases in rural areas have increased nearly three times faster than in large urban areas (AIDS Alert, 1995). In Lam and Liu's (1995) study of AIDS in all U.S. counties, most of the top 25 counties experiencing rapid increases in AIDS cases were predominantly rural. Their study suggested the AIDS epidemic has entered a dangerous phase of spreading to rural America .

No community is immune from the deadly pandemic of HIV/AIDS, and the incidence of the infection varies from urban to rural communities due to different factors. Generally, the spread of rural AIDS is influenced by factors such as fear and bigotry of AIDS, ignorance, and misinformation, lack of access to health care services, lack of effective AIDS/STD education programs, and an increasing need for public health specialists (The US Presidential Commission on the HIV Epidemic, 1988). Lifestyles such as work and recreation activities and economic orientation such as risk-occupations are also unique to rural areas (Torabi, 1996). In addition, compared with their urban counterparts, rural residents consider religion and the role of the church to be very important in community life, hold more traditional moral values, expect greater conformity to community norms, and are less tolerant of diversity (Rounds, 1988). In a newly published fact sheet by the Indiana Rural Center for AIDS/STD Prevention, characteristics of rural HIV were identified as relative young age, co-existence of STDs other than AIDS, heterosexual mode of HIV transmission, increasing cases in women, and high prevalence in Hispanics and Blacks (Indiana Rural Center for AIDS/STD Prevention, 1996). Numerous researchers also studied different aspects of AIDS/STD in rural areas.

However, with the fact that there is no cure or vaccine available to fight AIDS or prevent its transmission, "prevention through education and empowerment of individuals in making intelligent decisions is the only option for the control of AIDS/HIV"(Torabi, 1996, p. 37). The Rural Center for AIDS/STD Prevention was established in 1994, with a goal of reducing the presence of AIDS/STD incidence in rural communities. The center functions in developing and evaluating educational materials and approaches, examining the behavioral and social barriers to AIDS/STD prevention, and providing prevention resources to professionals and the public.

In order for the Center to achieve its mission in 1994, the Center conducted a survey on AIDS/STD Educational Needs Assessment at the Rural Setting. The purpose of the survey was to examine Indiana rural community needs and perspectives regarding HIV/STD risks and programs (Torabi, 1996). The survey was repeated a year later, and included urban population in the survey with a notation of examining the difference between urban and rural populations about their perceptions regarding the measured variables. It is believed that such surveys provide useful information for understanding the local needs of AIDS/STD prevention and education programs. Consequently, the results of the study should provide needed information to develop community sensitive educational and intervention programs in preventing HIV/STD infection and for promoting health in the communities.

Methodology

Study Setting and Sample

All residents of the state of Indiana age 18 years and older who live in households that could be contacted by telephone were targeted as the study population. Standard Random Digit Dialing (RDD) methodology (i.e. including all households with one or more telephones, and those with unlisted) were used to randomly generate survey sample households. At each residential telephone number which was answered, a respondent was randomly selected to be interviewed.

Data Collection and Questionnaire

Data were collected using telephone interview technique. The survey questionnaire was obtained by modifying the 1994 Indiana AIDS/STD Educational Needs Assessment Survey Questionnaire (Torabi, 1996), and consisted of 35

questions including demographic information and several open-ended questions. The Indiana University Center for Survey Research (CSR) in Bloomington conducted the telephone interview.

The data were collected by telephone using the University of California Computer Assisted Survey Methods software (CASES). Interviews were conducted from: 9:00 AM - 9:30 PM weekdays, 9:00 AM - 1:00 PM Saturday, and 1:00 PM - 9:30 PM Sunday. A total of 854 interviews were completed.

Data analysis

Respondents' residency locations were categorized as city/suburban and small town/rural based on a population size of larger or smaller than 50,000. Data were analyzed by using the Statistics Package for Social Sciences (SPSS) program. The collected data were subjected to descriptive statistics and chi-square statistical test of significance. Open-ended questions were categorized by using a word processor computer program. The statistical significance was set at alpha 0.05 level.

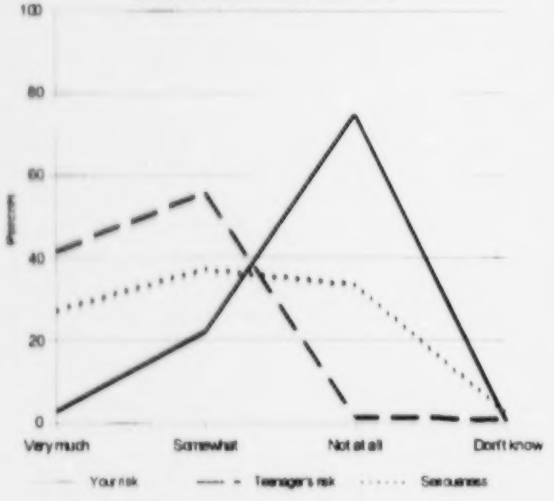
Findings

A total of 854 adults fully participated in the study. The margin of error for 95 percent confidence of all proportions reported here was about 3.5 %. The respondents' age varied from 18 to 85 years with the mode being 30 to 44 years old. About 61% of the participants were female and 39% were male. With regard to the educational background, approximately half of the participants completed 12 grades or had completed some college courses and over 30% had a college degree or above college level degree. Almost half of the respondents were from urban or suburban areas (48.8%), and 50.7% were from small town or rural areas. The remaining 0.5% didn't define their living locations. Among the total respondents, 61% were employed, 18% were retired, and the remaining were house keepers, students, and others. About 30% of respondents indicated an annual income below $25,000, over one third have an income between $25,000 to $50,000, 27% indicated an income over $50,000, and 6.7% of the respondents didn't provide information about their income. The political party affiliation of respondents were as follows: 26.5% democrat, 29.9% republican, and 26.8% independent. About 7.1% of the respondents reported that they belong to other political parties and the remaining 10% have no political party affiliation. However, 16.7% of the respondents consider themselves as "liberal," 26.5% think they are "moderate," and 29% category themselves as conservative. Slightly over one quarter of the respondents consider that they do not fall in those categories, and a few (1.5%) did not respond to this question.

The respondents were asked about their opinions regarding the risks of getting AIDS or STDs for themselves and for teenagers, and the seriousness of the problem of AIDS or STDs in their communities. Among the total respondents, few perceived themselves as very much at risk of getting AIDS or STDs (2.7% and 1.3%, respectively), some perceived the risks of getting AIDS or STDs as somewhat (22.0% and 12.0%, respectively), and most thought they were not at risk of getting either disease (75.0% of AIDS and 86.5% of STDs). Comparing their opinions with those reported by teenagers, the figures were reversed. Over 40% thought teenagers were very much at risk of getting AIDS, and one third thought they were very much at risk of getting STDs. The percentages of those who thought teenagers somewhat at risk of getting AIDS or STDs were 56% and 64%, respectively. Only 1.4% and 2.2% indicated teenagers are not at all at risk of getting AIDS or STDs, respectively. However, regarding the seriousness of the problems of AIDS or STDs in their communities, about two thirds (62%) thought AIDS, and three fourth (76.5%) thought STDs were somewhat or very much serious health problems in their community.

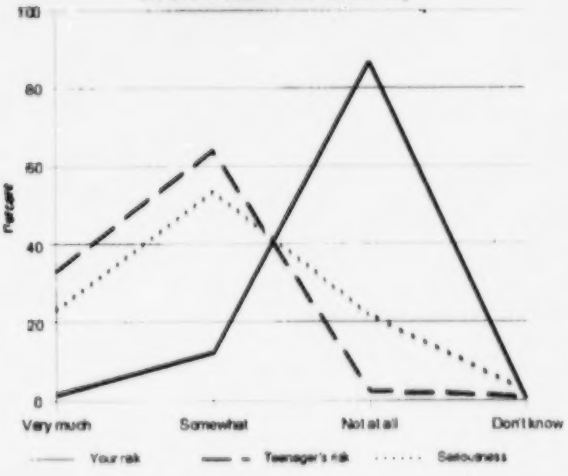
The comparison of respondents' perceptions regarding their risk of getting AIDS, teenagers' risk of getting AIDS, and the seriousness of an AIDS problem in their community is shown in Figure 1.

Figure 1. Perceived Risk of Getting AIDS and the Seriousness of the AIDS Problem in the Community



As Figure 1 shows, teenager's risk of getting AIDS was the greatest reported concern, followed by the seriousness of an AIDS problem in their community, and then their own risk of getting AIDS. Chi-square test indicated that the above pattern of difference was statistically significant at $p<0.01$ level. Figure 2 shows the respondents' perceptions regarding their risk of getting STDs, teenagers' risk of getting STDs, and the seriousness of the problem of STDs in their commu-

Figure 2. Perceived Risk of Getting STDs and the Seriousness of the STD Problem in the Community



nity.

As Figure 2 shows, the response shows that teenagers' risk was of highest concern, the seriousness of an STD problem in their community was second, and their own risk of getting STDs was of least concern. Chi-square test revealed a statistically significant difference ($p<0.01$) regarding the above perceptions.

Table 1 displays the comparison of perceptions related to the risks of AIDS and STDs, and the seriousness of the AIDS problems and STDs problems in the community. In general, there were significantly more respondents who perceived their own risk of getting AIDS as very much or somewhat higher than those who perceived their own risk of getting STDs as being very much or somewhat higher ($p<0.01$). Significantly more respondents considered STDs as a serious or somewhat serious problem in their community than those who considered AIDS as a serious or somewhat serious problem in their community ($p<0.01$). Significantly more respondents indicated that teenagers were very much at risk of getting AIDS than those who were concerned about teenagers' risk of getting STDs ($p<0.01$).

Perceptions of the risks of getting AIDS and STDs and the seriousness of the AIDS problem and the STDs problem between respondents from urban/suburban areas and from small town/rural areas were further compared by using chi-square test (Table 2). Cases with responses of "Don't know," "Refused," or "Missing" were omitted. It is interesting to note that significantly more respondents from urban areas perceived the problems of AIDS and STDs in their communities was very much or somewhat serious compared to small town/rural respondents ($p<0.01$). Significantly more city/suburban respondents perceived teenagers as being very much at risk of getting STDs compared to the small town/rural respondents ($p<0.05$). At the same time, significantly more small town/rural respondents considered teenagers as being somewhat at risk of getting STDs compared to the city/suburban respondents ($p<0.05$). No significant difference was found regarding respondents' perception of teenagers' risk of getting AIDS and their own risk of getting AIDS or STDs.

The perceptions of respondents from small town or rural areas were compared with data from the 1994 survey. As Table 3 shows, except that the perceptions of respondents own risk of getting AIDS or STDs remained unchanged ($p>0.05$), a greater proportion of people surveyed in 1995 perceived the risks for teenagers and the seriousness of the problems in their community as very much or somewhat higher compared to those surveyed in 1994 ($p<0.01$). It indicates an increasing awareness of the seriousness of the problem of AIDS and STDs and teenagers' risks of getting AIDS.

Six 10-point rating questions were used to find out the

Table 1 **Comparisons of Opinions upon Perceived Risks of Getting AIDS and STDs, and the Seriousness of the Problems of AIDS and STDs in the Community (n=854)**

	AIDS%	STDs%	chi-square
How much at risk YOU are of getting			
Very much at risk	2.7	1.1	36.17*
Somewhat at risk	22.0	12.1	
Not at risk	74.9	86.5	
Don't Know	.4	.1	
How much at risk TEENAGERS are of getting			
Very much at risk	41.7	32.9	14.93*
Somewhat at risk	56.0	63.9	
Not at risk	1.4	2.2	
Don't know	.9	.9	
How Serious the problems in community			
Very serious	27.2	23.1	50.08*
Somewhat serious	37.1	53.4	
Not very/not at all serious	33.4	21.4	
Don't Know/Refused	2.3	2.1	

*p<0.01

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Table 2 **Comparisons of Perceived Risks of Getting AIDS or STDs and the Seriousness of AIDS or STD Problem in the Community by Living Location**

	Very Much	Somewhat	Not very Not at all	Total(n)	Chi-square
Seriousness of STD in community					
Urban/suburban	26.7	56.7	16.6	100 (409)	13.74**
Small town/rural	20.7	52.5	26.8	100 (425)	
Seriousness of AIDS in community					
Urban/suburban	34.7	41.1	24.2	100 (409)	38.74**
Small town/rural	21.3	35.0	43.7	100 (423)	
Teenagers' risk of getting STDs					
Urban/suburban	37.7	60.1	2.2	100 (414)	7.33*
Small town/rural	28.9	68.8	2.3	100 (429)	
Teenagers' risk of getting AIDS					
Urban/suburban	43.5	55.0	1.4	100 (416)	0.79
Small town/rural	40.5	58.1	1.4	100 (427)	
Your risk of getting STDs					
Urban/suburban	1.2	14.1	84.7	100 (417)	3.20
Small town/rural	1.4	10.2	88.5	100 (433)	
Your risk of getting AIDS					
Urban/suburban	2.2	24.3	73.5	100 (415)	2.89
Small town/rural	3.2	20.1	76.7	100 (433)	

*$p<0.05$
**$p<0.01$

public's views on importance of strategies and ways that AIDS and STDs can be prevented. The alternatives for these rating questions vary from "extremely important" to "not at all important." The questions focused on the importance of the following areas for preventing AIDS/STDs including the importance of doing research and having pamphlets, books, or videos available. Despite the fact that only 486 respondents answered all six questions, a total of 569 respondents (66.6% of all surveyed) ranked "extremely important" to at least one of the six questions and 167, nearly 20% of the total surveyed, selected "extremely important" on all of the six questions. On the contrary, approximately 5% of the total respondents answered "not at all important" to at least one question. With a number of respondents who did not answer all of the six questions, it is noticeable that, based on the data, when respondents did answer the questions, they were more likely to select between "extremely important" and "somewhat important."

When asked "What do you think the Center can do in order to reduce the incidence of AIDS/STDs in communities?" 418 respondents answered this open-ended question. Their responses were categorized and sythesized into the following major categories presented in Figure 3. Figure 3 shows the majority of the respondents (69%) indicated working with schools and communities in health education and health promotion as the most important thing the Center can do. Other suggestions included promoting abstinence/morals (7%), doing research in AIDS/STDs prevention (4%), involving parents/families (4%), and providing condoms in schools and communities (3%).

Specific activities for working with schools and communities were recommended. In general, respondents believed that improving education in schools and communities; focusing on teenagers; providing information; producing videos, preparing pamphlets, and making books available to children and the public; providing education programs; and promoting awareness are important things in AIDS prevention. Some respondents also indicated having educators and/or AIDS patients talk with kids face-to-face, offering seminars, meetings, or classes could be an effective means. Other related activities included having a radio program and phone hotline, and providing information via advertisement, newspapers, TV, and telephones.

Although a few of the respondents spoke differently from most of the others, their voices should not be muted. For example, one respondent suggested an innovation of current (AIDS) education is necessary. "I don't think the kids are going to pick up a book or pamphlets or video on their own," The suggestion was also made to have "innovative persons to catch kids' attention." Another respondent said, "I think most people know that the danger is out there, but they choose to risk it. So I don't think there are any easy answers."

As to the public awareness of the Rural Center for AIDS/STD Prevention, nearly 10% of the total respondents indicated they knew the existence of the Center prior to the survey, including 11.1% from city/suburban and 8.1% from small town or rural areas. There is no significant difference between the two groups regarding their awareness of the Center (chi-square test, $p>0.05$). Compared to 1994 data, an equal percentage of the respondents from small town/rural reported that they had heard about the Center prior to the survey (8.1% vs. 8.1%, respectively).

Regarding respondents' attitude toward the existence of the Center, over 40% strongly or somewhat strongly sup-

Table 3

Comparisons of Perceived Risks of Getting AIDS or STDs, and the Seriousness of AIDS or STD Problem in the Community by Rural Respondents by Year

	Very Much	Somewhat	Not very Not at all	Total(n)	Chi-square
Seriousness of STD in community					
1994	12.1	50.7	37.2	100(537)	19.08*
1995	20.7	52.5	26.8	100(425)	
Seriousness of AIDS in community					
1994	10.6	31.7	57.7	100(540)	27.26*
1995	21.3	35.0	43.7	100(423)	
Teenagers' risk of getting STDs					
1994	21.5	73.7	4.8	100(544)	10.00*
1995	28.9	68.8	2.3	100(429)	
Teenagers' risk of getting AIDS					
1994	30.2	65.0	4.8	100(540)	17.54*
1995	40.5	58.1	1.4	100(427)	
Your risk of getting STDs					
1994	0.7	9.9	89.4	100(555)	1.10
1995	1.4	10.2	88.5	100(433)	
Your risk of getting AIDS					
1994	1.1	20.0	78.9	100(554)	5.7
1995	3.2	20.1	76.7	100(433)	

note: 1995 data were those from small town or rural area only.

*p<0.01

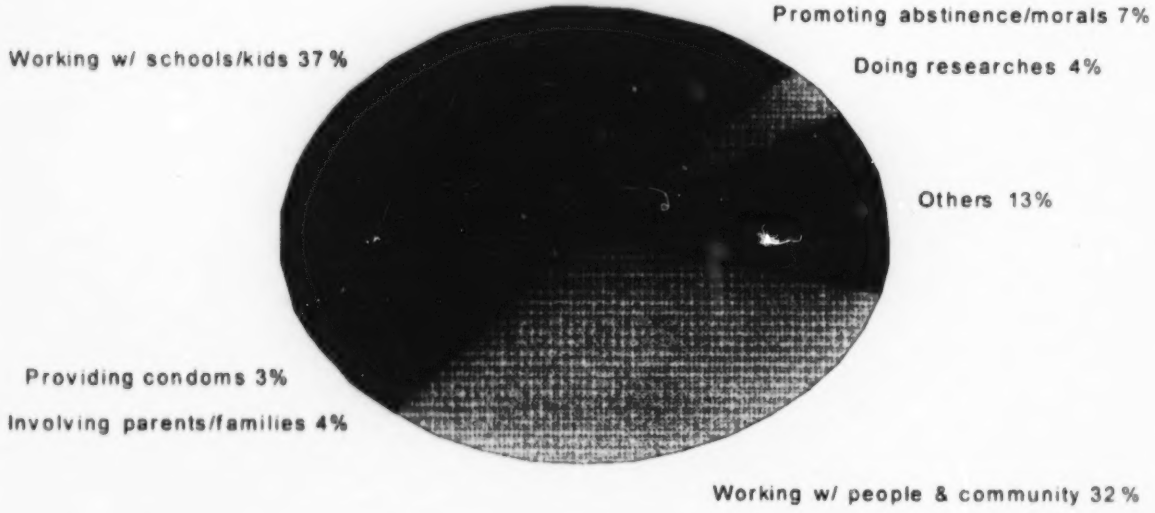
ported it, less than 2% somewhat or strongly opposed it, and the remainder selected "don't know enough about it." There was no significant difference regarding attitude between small town/rural and urban/suburban respondents' support for the Center. Compared to 1994 data using small town/rural sample, a slightly more people in 1995 than in 1994 reported they strongly or somewhat strongly supported the existence of the Center (41.2% vs. 38.1%), while slightly more respondents in 1995 than in 1994 reported strongly or somewhat strongly opposing its existence (1.6% vs. 0.9%). However, both differences were not statistically significant (Chi-square test, p>0.05).

Discussion

Respondents tended to perceive problems of others to be more serious than problems to themselves. More respondents considered teenagers to be very much at risk of getting AIDS/ STDs than their own risks, and perceived the problems of AIDS/STDs to be serious in their communities. When comparing the risks of getting AIDS versus STDs, respondents added more weight on AIDS than on STDs. These findings have two important implications for health education. According to the Health Believe Model, individuals vary widely in their feelings of personal vulnerability to a condition, and the combined levels of susceptibility and severity provide the energy or force to act (Nancy & Becker, 1984). A smaller proportion of respondents who perceived themselves to be at risk of getting AIDS and STDs may impact health education program design and implementation when such programs are aimed at behavioral change. However, for those programs focusing on promoting public awareness or education for teenagers/adolescents, community involvement and/or family/parents involvement is a good strategy because a large proportion of the adult subjects perceived the seriousness and susceptibility of the problems for their community and the teenagers.

Fewer respondents from rural areas perceived the seriousness of AIDS/STDs in their communities. This could be partially due to these diseases being less prevalent in rural areas. Generally, they possessed the same or similar opinions about their own risks and teenagers' risk of getting AIDS/ STDS. It is encouraging to see an increasing awareness of the seriousness of AIDS/STDs and teenagers' risk of getting AIDS/STDs. More respondents from rural areas in 1995 than in 1994 perceived the seriousness and risks. This might be due to the collective efforts of advocating AIDS/STDs prevention and education by government, local community health agencies, media, health educators at large, the Center's activities, and because of the higher deadly nature of AIDS. The data did not reveal any difference between urban and rural communities with regard to their awareness about the existence of the Center. However, 10% of the respondents reported knowing about the Center, and over 40% declared they supported such a Center. Hopefully, this support may help the Center to engage in AIDS/STDs prevention and education continuously. The Indiana residents were very thoughtful in offering good suggestions for the Center's roles and educational and research missions. Their suggestions covered almost all strategies/approaches that current health education has adopted, such as improving school and community health education, using mass media, disseminating pamphlets, books and videos. From the responses, it is easy to see what respondents thought about how the Center can continue to meet local needs.

Figure 3. What the Center Can Do in Order to Reduce the Incidences of AIDS/STDs



Recommendation

Based on the findings of this project, the following recommendations are offered:

1. It is important that rural community needs and perceptions regarding AIDS/STD prevention be periodically examined, interpreted, reported, and widely disseminated.
2. A supportive attitude toward the work on AIDS/STD prevention and a variety of recommendations about what can be done to reflect the needs of the communities in AIDS/STD prevention and education. It is recommended that in order to design an effective, community oriented appropriate toward AIDS/STD educational intervention, health education agencies, including the Center, should take local needs and perceptions into serious consideration when developing new educational intervention activities.
3. Educational programs for teenagers should involve community and parents/family members to maximize its effect.
4. It is widely recognized that dissemination of videos, books, pamphlets, and other educational materials are important mediators in community AIDS/STD prevention. Therefore, it should be one of the priorities for health education agencies to continually develop and distribute sound educational materials to the communities.

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Efficacy of Two School-Based Interventions Designed to Reduce Rural Adolescent Risk of HIV/STD*

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Abstract

This study evaluated the efficacy of a government sponsored, theory-based school curriculum, STDs and HIV: A Guide for Today's Young Adults *(Yarber, 1993), on a sample of 282 secondary school students enrolled in health science classes in two rural high schools in a midwestern state. A quasi-experimental design involving an intervention group, an intervention plus booster group, and a comparison group and a pretest, immediate posttest, and delayed posttest was used. The intervention group received 10 class sessions of instruction, the intervention plus booster group received the same ten sessions with an additional two sessions of instruction, and the comparison group did not receive any instruction during the project. Student HIV/STD-related attitudes (belief, feeling, intention to act and total attitude), knowledge and confidence to resist peer pressure were assessed. Analyses indicated that the curriculum was overall effective in improving HIV/STD-related beliefs, feelings, and total attitudes for both genders, but did not improve knowledge or confidence. The testing of the intervention plus booster yielded mixed results, with this treatment being the only effective intervention for males. The results support the application of a theory-based school curriculum for HIV/STD prevention education for rural adolescents.*

The rate of HIV infection and the number of new AIDS and STD cases among our nation's young people is growing rapidly. A recent National Institutes of Health (1997) consensus statement indicated that the HIV epidemic in the United States is shifting to young people, and the federal government reports widespread STD infection among our youth (Centers for Disease Control [CDC], 1993).

One-quarter of all new HIV infections in the United States are estimated to occur in persons between ages of 13 and 20, meaning that two Americans under the age of 20 become infected with HIV every hour of each day (Office of National AIDS Policy [ONAP], 1996). Current surveillance data indicated that 22 and 17 percent of all female and male AIDS cases, respectively, were contracted between the ages of 10 and 19 (CDC, 1996). The HIV epidemic is spreading into suburban communities and the nation's rural areas. Rural HIV epidemics have been characterized as epidemics of youth (ONAP, 1996; Rumley, Shappley, Waivers, & Eisenhart, 1991; Young, Sandor, Brackin, & Thompson, 1992).

The U. S. Centers for Disease Control and Prevention (1993) stated that approximately 3 million teenagers acquire an STD every year. Further, 25 percent of sexually active adolescents contract an STD each year (Collins, 1997).

Adolescents (10-19 years of age) and young adults (20-24) are the groups at greatest risk for acquiring HIV/STD. They are more likely to have multiple sex partners and to engage in unprotected intercourse, and their partners may be at higher risk for being infected compared to other adults. Specifically, by high school graduation, 70 percent of students have engaged in intercourse at least once, and 27 percent have had coitus with four or more partners (Institute of Medicine, 1996). Further, a significant number of young people are having sexual intercourse and using drugs and alcohol at earlier ages (ONAP, 1996).

Prevention education has long been considered the most desired approach to controlling HIV/STD. Education is particularly important for adolescents as many become introduced to HIV/STD-related situations. According to the Institute of Medicine (1996) adolescence is the crucial period for adopting healthy behaviors and schools are one of the few available institutions for reaching young people. Given about 95 percent of young people attend school (Mullen, 1981), schools can play a major role in reaching our youth.

Several efficacy studies of school-based HIV/STD prevention education have been conducted, showing mixed results. Some showed improved knowledge, attitudes, and prevention/risk reduction behaviors (Clark & Yarber, 1993; Holtgrave et al., 1995; Kirby et al., 1994; Yarber 1989; Yarber & Torabi, 1997). From an analysis of sexual risk-reduction programs showing positive impact, Kirby et al. (1994) identified the key components of successful school-based, interventions. One of these components is that effective programs utilized social learning theories. Further research of theoretical-based programs has been widely recommended (Levy et al., 1995; Jacobs & Wolf, 1995;

Newman, DuRant, Ashworth & Gaillard, 1993).

One strategy suggested for improving student learning is the utilization of booster sessions following the instructional unit (Perry & Kelder, 1992). Zajonc (1968) provided empirical evidence that repeated exposure to a message increases the likelihood of action. This approach has been successfully applied to social marketing of HIV preventive behaviors (CDC, 1995; Ramah & Cassidy, 1992).

A review of the school-based HIV/STD prevention education literature failed to show any studies that targeted rural adolescents or that incorporated a booster session into the intervention program. Given the escalation of HIV/STD in rural America (Lam & Liu, 1994; Rural Center for Study and Promotion of HIV/STD Prevention [RCSPHP], 1996), research concerning the efficacy of various educational interventions is urgently needed for this population. Therefore, this study was conducted to determine the efficacy of a theory-based, HIV/STD education program in rural secondary schools. Further, the investigation examined the impact of a booster session on learning outcomes. The intervention tested was government-sponsored curriculum based on promising cognitive and social learning theories of behavior change and included both HIV and STD prevention behavior messages.

Method

Subjects

The subjects were limited to 282 students who were enrolled in the ninth-grade health science classes of two high schools in two Indiana rural communities. Each of these communities met the criterion for a rural county (50,0000 population or less) utilized by the CDC (CDC, 1996). Both the female and male subjects comprised exactly 50 percent of the sample, with about 53 percent, 32 percent, 10 percent, and 5 percent being 14, 15, 16 and 17 years old, respectively. Ninety percent were White and about 7 percent were Black, with the remainder being either Oriental, Hispanic, or Native American Indian.

For females, 48, 56, and 37 subjects were in the intervention, intervention plus booster, and comparison groups, respectively. For males, 65, 33, and 43 subjects, respectively, were in the intervention, intervention plus booster, and comparison groups.

Research Design and Intervention

A quasi-experimental, pretest/multiple posttest design involving three groups — intervention (I), intervention plus booster (I+B), comparison (C) — was utilized for the study (see Figure 1). Classes were randomly assigned to the three groups. The groups each had five classes, with three classes for each group coming from one school and two classes per group from the other school. Two, state-licensed, health science teachers taught all three groups at both schools.

The intervention groups received HIV/STD instruction using the curriculum, *STDs and HIV: A Guide for Today's Young Adults* (Yarber, 1993). The curriculum, developed via a government contract and based on cognitive and social learning theory, emphasizes individual preventive health behaviors in contrast to biomedical information, and consists of a student and instructor's guide. This curriculum has the potential for widespread application because it is flexible relative to which learning opportunities are utilized, thus allowing for its integration into varied communities. The interventions were based on daily lesson plans suggested in the instructor's guide which utilizes various cognitive, affective, and skill-based learning opportunities and worksheets.

Both the I and the I+B groups had ten class sessions (approximately 500 minutes) of similar instruction on the same dates. The I+B group received an additional two class sessions of instruction (approximately 100 minutes) 2 1/2 weeks following the end date of the 10-class session intervention.

All teachers utilized the lesson plan and completed log sheets during the intervention to monitor instructional activities and time spent on each activity. Teachers received inservice education on implementing the curriculum and conducting the testing.

The comparison group did not receive HIV/STD instruction during the study, but did receive the instruction following the delayed test. Instructor log sheets indicated that the comparison group classes did not receive sexuality education, HIV/STD education, nor disease prevention instruction between the pretest and delayed testings.

Procedures and Instrumentation

Parent/guardian and student permission were required for student participation. The total parent and student refusal was less than five percent of the entire population. The study was conducted during the first semester of 1995.

All students were administered the same paper-and-pencil questionnaire for all three testing sessions: (a) immediately prior to instruction (pretest); (b) immediately following the date of I+B (immediate posttest); (c) four weeks following the posttest (delayed posttest). The questionnaire assessed the following dependent variables: (a) HIV/STD-related attitudes (belief, feeling, intention to act, total attitude); (b) knowledge; (c) and confidence to resist peer pressure. Students completed the questionnaire anonymously and in private, and deposited it in a collection box to protect confidentiality. Gender, ethnicity, age, and day and month of birth were assessed. Besides helping to describe the subjects, this information was used to match a student's questionnaire for all three testing sessions.

Attitudes were measured by a summated rating scale utilizing the 5-point, Likert-type format for measuring students' HIV/STD-related beliefs, feelings, and intention to act. The scale items reflected three conceptual areas: (a) the nature of STDs; (b) STD prevention; (c) STD treatment. Four items

specifically related to HIV infection and one item related to condoms were added to a previously developed 27 item questionnaire (Yarber, Torabi, & Veenker, 1989), resulting in 31 total items (11 items for beliefs, 9 items for feelings, and 11 items for intention to act). Examples of STD (gonorrhea, genital herpes, syphilis, HIV infection, and AIDS) were provided on the questionnaire. A lower scale or subscale score is indicative of a more favorable attitude toward HIV/STD prevention.

Knowledge was measured by a modified version of a previously developed HIV knowledge test (Yarber & Torabi, 1990/1991), in which fourteen questions most related to prevention were taken from the original 30-item test. Eleven items measured the knowledge domain, with three items measuring application. The acronym "STD" was substituted for HIV or added to items and answers to broaden the scope of the test beyond HIV. The knowledge test was scored with one point per correct answer, resulting in the higher score reflecting a higher level of knowledge about HIV/STD prevention behavior.

Student confidence in one's ability to resist peer pressure was measured by a modified version of an instrument published by the CDC (CDC, n.d.). Five of the original 10 items that were most related to HIV/STD risk behavior were utilized for this study. The instrument measures how confident students are that they could refuse their friends in order to avoid an uncomfortable or risky situation. Confidence in one's ability to use a skill (e.g., refusal skill) may be a particularly important factor contributing to one's actual use of that skill.

The reliability of the instruments, established during the study, is reported in Table 1.

Data Treatment

Only those students completing the questionnaire at all three testing sessions were included in the data analysis. Data from each of the six dependent variables were analyzed separately using a 3 X 2 X 3 (Group by Gender by Time) analysis of variance procedure. For those tests in which a significant interaction was found, one-way analysis of variance was conducted to analyze main effects and a least significant difference (LSD) test was used to compare group means. Acceptance of significance was based on the .05 alpha level.

Results

Significance was established for three of the six 3 X 2 X 3 ANOVAS: (a) belief; (b) feeling; (3) total attitude. Based on significant Gender by Group interactions, we determined that data should be reported by gender. For these three variables, female mean scores were consistently lower (lower risk attitude) than for males. The mean scores for both genders for these three variables are found in Figures 2-7.

Females

As shown in Figure 2, the data revealed that both the I and I+B groups experienced a treatment effect for beliefs, although this effect was significant only at the immediate posttest. Figure 3 indicates a treatment effect for the I group for feelings at the immediate posttest only. Figure 4 indicates a treatment effect for both the I and I+B groups for total attitude at the immediate posttest only.

Males

As shown in Figure 5, the data revealed that I+B group experienced a treatment effect for beliefs at both the immediate posttest and the delayed posttest. Figure 6 indicates a treatment for the I group for feelings at both the immediate posttest and delayed posttest. Figure 7 indicates a treatment effect for the I+B group for total attitude at both the immediate posttest and delayed posttest.

Discussion

As revealed by the results of the statistical tests, this study determined that the tested curriculum was overall effective in improving HIV/STD-related attitudes (belief, feeling, and total attitude) for both genders in the sample utilized here. The curriculum failed to improve student HIV/STD-related knowledge or confidence.

This investigation provides further empirical evidence of the importance of a theory-based approach to improving adolescent attitudes toward HIV/STD prevention. Because attitudes are correlated with behavior (Ajzen, 1987), the curriculum shows some capability to favorably impact HIV/STD incidence rates.

The results support the application of the tested curriculum to rural adolescents. Given the escalating HIV/STD epidemic among adolescents in rural areas (RCSPHP, 1996; Rumely et al., 1991; Young et al., 1992), a more effective response is needed from our rural schools. The use of a tested, theory-based curriculum, such as the one utilized in this investigation, is therefore recommended.

Mixed results were established for the testing of the impact of the intervention that included a booster session. Although the curriculum was effective in improving attitudes for females, there was basically no difference in the impact between the interventions with or without the booster session. However, for males, the intervention with the booster was the only effective intervention for belief and total attitude. Therefore, the results partially support the value of repeated messages in HIV/STD education (Perry & Kelder, 1992; Zajonc, 1968). Possibly, a stronger intervention is needed to favorably impact male attitudes toward HIV/STD prevention. Investigators should continue to test the impact of booster sessions on HIV/STD-related variables by utilizing different booster models, such as repeated booster sessions, a longer booster session, or a booster given earlier or later than the one in this study.

In most instances, the impact of the tested curriculum upon belief, feeling and total attitudes decayed for both genders and for both interventions, although the decay was not always statistically significant. These results are congruent

with previous studies showing loss of impact over time (e.g., Yarber, 1988). Maintenance of positive gain of HIV/STD intervention program has been a consistent problem. Further research is needed to test various interventions to determine which approaches minimize loss (Kirby & DiClemente, 1994; Peterson & DiClimente, 1994).

The failure of the interventions to impact intention to act and confidence was disappointing. Anticipating positive changes in these variables may have been unrealistic. Intention to act is a difficult variable to impact, taking much more intervention and time than other attitude variables (Weinstein, 1988). Further, confidence is a complex self-perception that develops over time and is reinforced by active practice (Bandura, 1977).

The tested curriculum had no impact on improving student knowledge about HIV/STD prevention. Improvement of student knowledge may be difficult because of a ceiling effect. Given this effect and that knowledge is weakly associated with behavior, researchers would seemingly be wise not to investigate this variable in future intervention studies.

This study had limitations that typically occur in school-based curriculum evaluation projects. For example, subjects were not randomly assigned to the three testing groups, but intact classes were used. However, the classes were randomly assigned to the testing conditions. An extended follow-up of students was not possible because the intact classes utilized did not exist after the end of the semester. Even though all of the teachers used in this study followed a detailed lesson plan, individual differences in teaching style may have been a confounding factor.

Student HIV/STD-related behaviors were not measured because students do not necessarily have the opportunity to express many of the prevention behaviors. In lieu of assessing actual behavior, the study did measure intention to act which covers all of the HIV/STD prevention behaviors.

In summary, this study provided empirical evidence that a theory-based curriculum can improve the HIV/STD-related attitudes of rural adolescents. However, the data suggest that males may need a stronger intervention than females such as a booster session. The tested curriculum shows strong potential for widespread application and subseseq-uent reduction of HIV/STD incidence rates in rural areas.

Table 1

Cronbach Alpha Reliability Coefficients for the Study Instruments

Instrument	Female	Male
Belief subscale	.44	.51
Feeling subscale	.55	.48
Intention to act subscale	.79	.78
Total attitude scale	.77	.79
Knowledge	.68	.63
Confidence	.82	.71

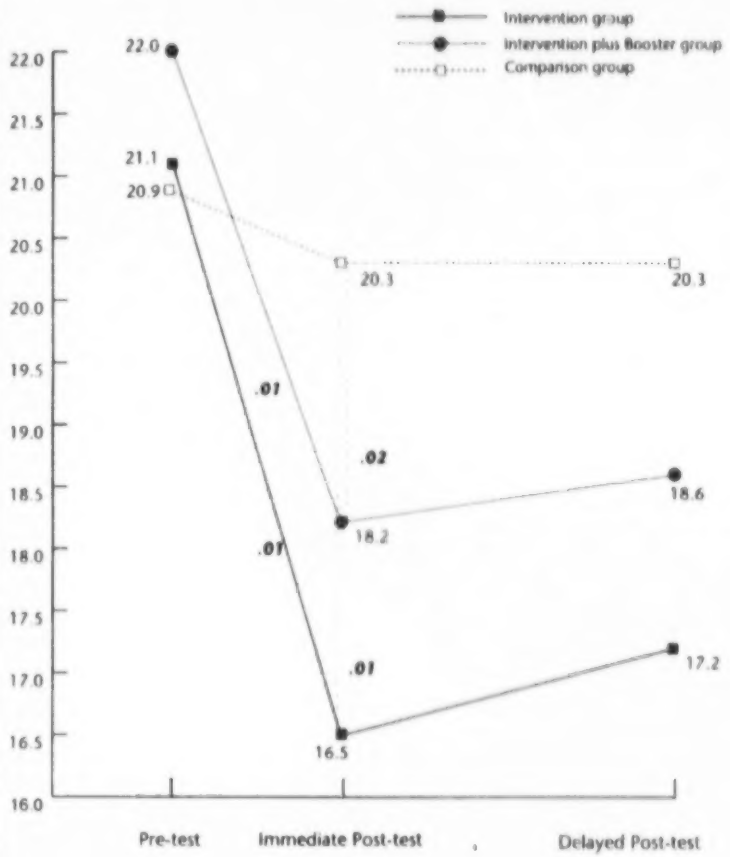
Figure 1.

Study Research Design: Quasi-experimental Pretest/Multiple Posttest Design

Group	Pretest	Unit	Booster	Immediate Posttest[3]	Delayed Posttest[4]	Unit
Intervention	0	X[1]		0	0	
Intervention plus booster	0	X[1]	X[2]	0	0	
Comparison	0			0	0	X

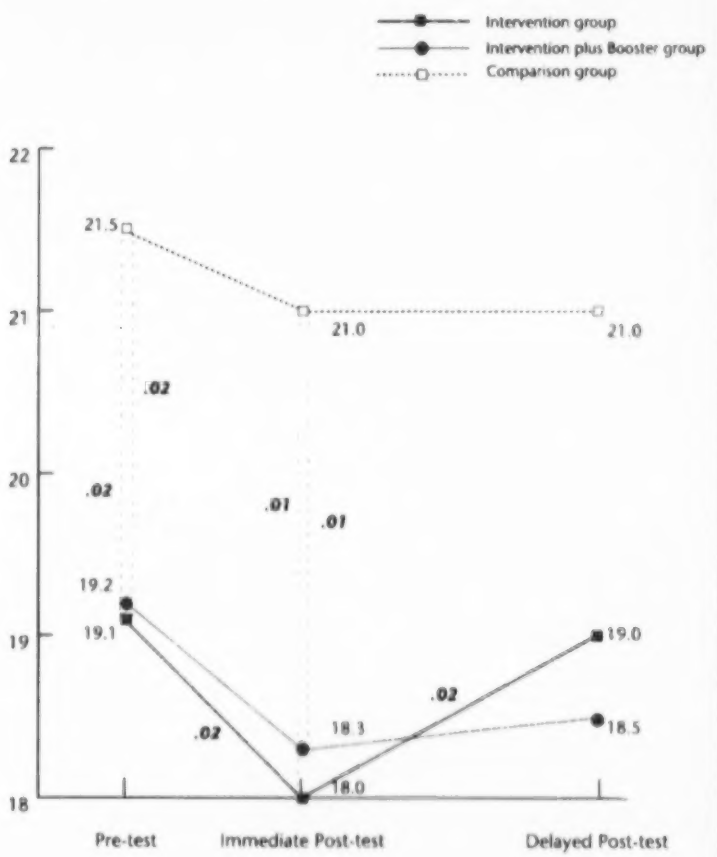
Key: 0 = testing session
X = HIV/STD instruction
1 = 10 class sessions (approximately 500 minutes)
2 = 2 class sessions (approximately 100 minutes) given 2 weeks following the unit
3 = given next day following booster session
4 = given approximately four weeks following immediate posttest

Figure 2: Belief Mean Scores and Significant Test Results for Female Subjects



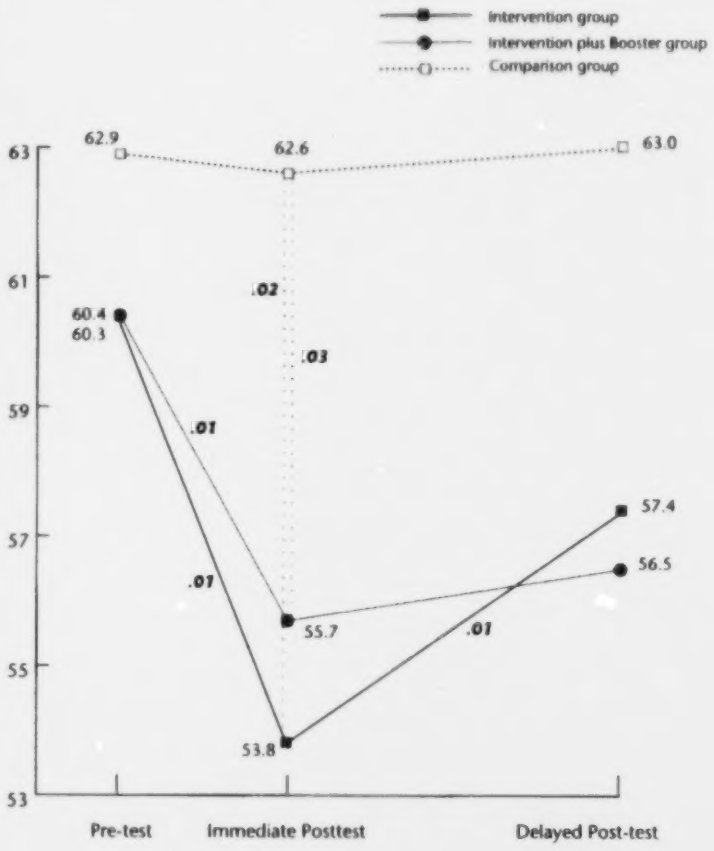
Note: A lower score is indicative of a more favorable attitude.
Significant test results reported only.
Bold italics represent p values derived from LSD post-hoc analysis.

Figure 3: Feeling Mean Scores and Significant Test Results for Female Subjects



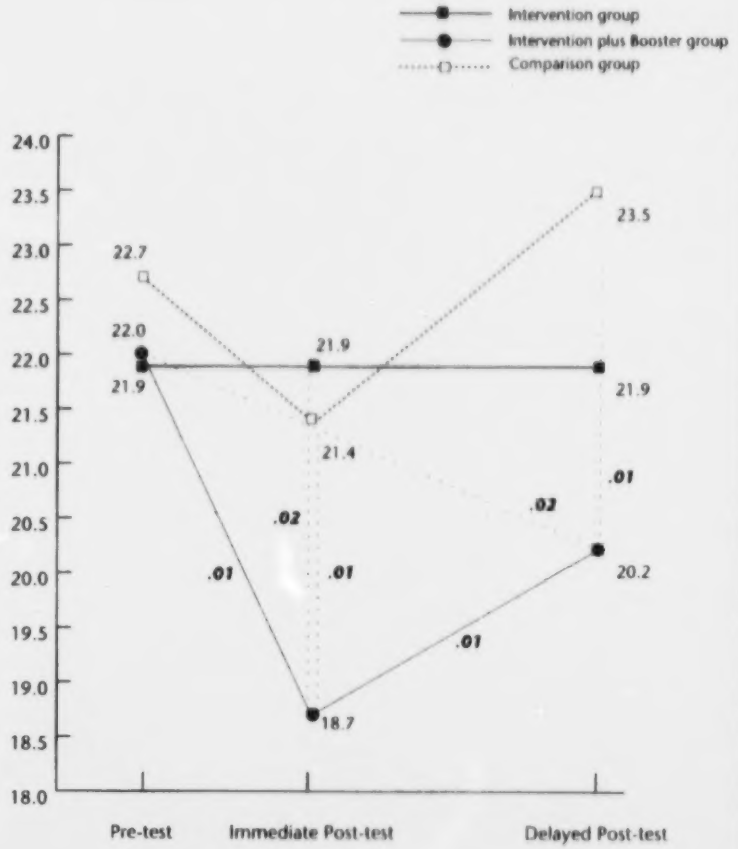
Note: A lower score is indicative of a more favorable attitude.
Significant test results reported only.
Bold italics represent p values derived from LSD post-hoc analysis.

Figure 4: Total Attitude Mean Scores and Significant Test Results for Female Subjects



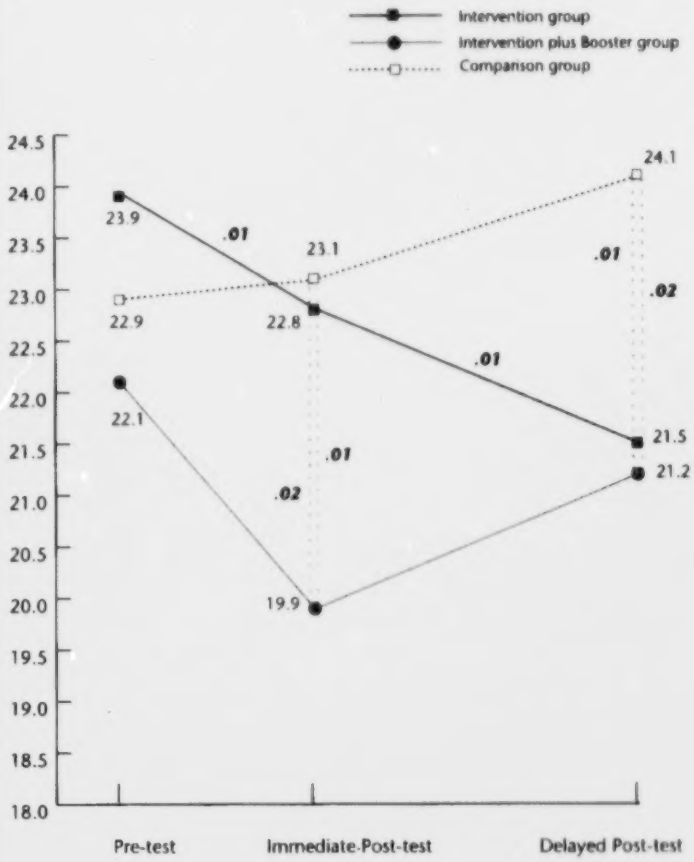
Note: A lower score is indicative of a more favorable attitude.
Significant test results reported only.
Bold italics represent p values derived from LSD post-hoc analysis.

Figure 5: Belief Mean Scores and Significant Test Results for Male Subjects



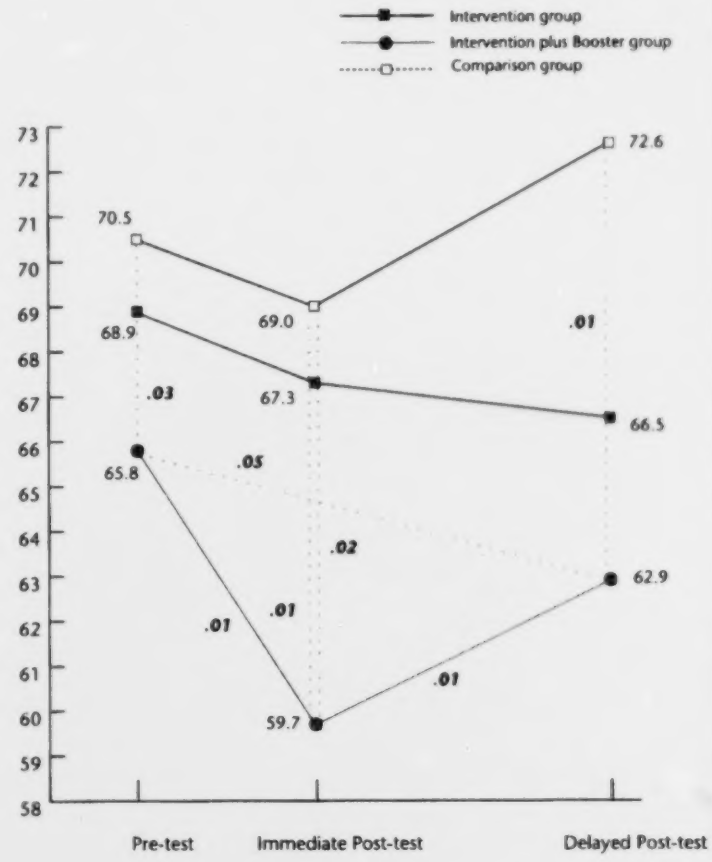
Note: A lower score is indicative of a more favorable attitude.
Significant test results reported only.
Bold italics represent p values derived from LSD post-hoc analysis.

Figure 6: Feeling Mean Scores and Significant Test Results for Male Subjects



Note: A lower score is indicative of a more favorable attitude.
Significant test results reported only.
Bold italics represent p values derived from LSD post-hoc analysis.

Figure 7: Total Attitude Mean Scores and Significant Test Results for Male Subjects



Note: A lower score is indicative of a more favorable attitude.
Significant test results reported only.
Bold italics represent p values derived from LSD post-hoc analysis.

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